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Editor
C. M. POULSEN

Managing Editor
G. GEOFFREY SMITH

Chief Photographer
JOHN YOXALL

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The Outlook

Aid From U.S.A.

LORD BEAVERBROOK, that energetic Canadian who has been given the stupendous and complicated task of making two aeroplanes fly where one flew before—or ten, if so be it that he can—gave us good news in his broadcast of Wednesday, July 24. The delivery of the broadcast was typical of the dynamic drive of this great newspaper man, and was reminiscent of the evangelism of the "hot gospellers" of America. (We wonder if it is only a coincidence that two people who hold their jobs by reason of the dynamic character of their achievements, the Prime Minister and the Minister of Aircraft Production, both have strong trans-atlantic affiliations.)

Lord Beaverbrook told us that "Mr. Morgenthau, Secretary of the Treasury in the U.S., will approve plans to put into immediate production aeroplanes for our account up to a total output of 3,000 per month. These plans will be developed without delay."

From some comments that have reached us, it seems that many people in this country think that the statement meant that on Thursday morning, July 25, 100 aeroplanes would leave U.S.A. by ship for this country, that being the daily total for a 30-day month. Such is, of course, nothing like the case, and Lord Beaverbrook's words should be referred to carefully, for they no doubt contain the truth, and are not intended to deceive. They will not be deceptive except to people who insist on deceiving themselves.

It is great news that aircraft production in the United States is to be expanded up to a rate of 3,000 per month, but a flow of aircraft to this country at that rate will not be available for some time. How long is not known, but, as the U.S.A. turned out aircraft of military value during 1939 at the rate of 200 per month, the time is likely to be considerable.

A democracy can only continue to exist if its people are fed with truth, even though such truth may be hard and unpalatable fact. To feed the people on the soft mush of deception and sing them soft lullabies that Fascism is not really such a menace to freedom, and that in any case our rearmament is proceeding and aircraft production has been doubled (as was done by our Governments for ten years before the war), will undermine the constitution of any free people.

So while applauding Lord Beaverbrook's efforts to increase production and congratulating him upon being able to make this significant announcement, we must point out that the concrete achievement of it, those 100 aeroplanes per day, will not be seen for some time yet.

Transatlantic Deliveries

THE Canadian paper *Commercial Aviation*, in its June number, draws attention to what must be always at the back of our Air Ministry's mind as an alternative method of delivery to shipping from America to England—that is, flying the Atlantic.

"And while Blitzkrieg and counter-Blitzkrieg eat into both Germany's and Britain's supply of 'planes, the Empire is holding an ace in the hole which may be used before the summer is out—mass transatlantic flight deliveries.

"Any doubt as to the possibilities of such deliveries may be dispelled now that Britain has occupied Iceland. The lonely [but it has a population of 100,000. —ED.] Arctic island can now be used as a refuelling base by the British, although all five bomber types now in production for the Allies in the United States are capable of flying from Newfoundland to Ireland non-stop."

Being able to land and refuel at Iceland is some help, but it does not shorten the distance by any very great fraction. It reduces the 2,000-odd miles between Botwood and Foynes by about 300, at the expense of increasing the total distance to England. The five types spoken about are given as the Consolidated 28-5 flying

boat, the Douglas DB-7 attack bomber, the Douglas B-20, also given as an attack bomber (or should this be the B-23?), the Lockheed Hudson and the Martin 167W. (The Martin ordered by France had the model number 167F.) All the types mentioned could not fly the Atlantic with standard tankage, but they could be specially tanked up for the occasion.

We agree with what is said on the subject of the greatest difficulty. "Biggest problem the Allies will face in the high-speed transatlantic shipment will be the securing of pilots with adequate experience. American pilots may be hired as 'ferrymen' similar to the many who have been hired as instructors under the Empire Air Training Plan. Their work would violate no American law."

Luftwaffe Variations

IN the past few days the Fighter Command has been enjoying a rather mixed bag. In addition to the stock Heinkel, Junkers, and Dornier bombers and the Messerschmitt fighters, it has added to its game book a Henschel army co-operation machine, Heinkel 113 fighters, Messerschmitt 110 and 109 bombers, and Vought-Sikorsky V-156 dive-bombers. The last-named aircraft had the curious history of having been designed and built by Americans, bought by Frenchmen, flown by Germans, and shot down by Britons.

There is probably no particular significance about this sudden appearance of unfamiliar types round our coasts. The appearance of the Henschel, which could never expect to survive when sighted by our fighters, must have been due to a mental aberration on the part of one of Göring's staff. A new German fighter was about due to appear, for both types of Messerschmitt must have been disappointments to the heads of the *Luftwaffe*, and as the He 111 is also quite due for replacement it was only to be expected that the Heinkel firm should devote itself to turning out fighters. The use of the Me 110 as a fast light bomber had always been foreseen by the Air Ministry as a possibility. It is not likely to be very destructive, but the men of its crew must rejoice in the better chance which its speed gives them of escaping from British fighters, provided that they start in good time.

More difficult to understand is the introduction, this week-end, of the Messerschmitt Me 109 in the *rôle* of a bomber. "One man, one bomb" is the slogan of one school of thought. That is to say, the argument is that a single-seater bomber capable of extremely great speed, carrying one large bomb and fuel for a considerable range, would stand a very good chance of evading anti-aircraft defences.

The Me 109, comparable in size with our Hurricanes and Spitfires, does not appear to be a very suitable type for this class of work. As a fighter it is much more heavily loaded per square foot of wing area than the British machines, and if the bomb it is to carry is to be of useful size, it seems likely that the loading has had to be increased. True, as a bomber it probably does not need so much manœuvrability, but that was a quality in which the Me 109 was somewhat lacking, even as a fighter.

One need not take too literally the reference to its use for dive bombing. It is unlikely that the machine would stand up to the flattening out, even if it had been fitted with air brakes to reduce the diving speed. But from the German point of view a high-speed bomber which can cut across the Channel, drop its bomb and be off home again may seem worth while.

It was only natural that the Germans should make use of aircraft captured from France, but the Vought-Sikorsky is a slow machine by modern standards, and its appearance over our coasts may well have been a bit of window dressing, to impress upon the British public that Germany can now command the resources of France. There is nothing in the new apparitions to make our flesh creep.

"ONE MAN, ONE BOMB"

The Messerschmitt Me 109, not having proved very brilliant as a fighter, has now been used as a single-seater, single-bomb bomber.

WAR in the AIR

Many Adventures : Heroic Fights : 28 Raiders Down in One Day

MEMORIES are short in wartime, and in the success or disaster of to-day the ordinary reader is apt to forget the success or disaster of yesterday. During last September both the Germans and ourselves were trying out the effect of attacks by bombers on moving warships, about which there had been much theoretical talk but of which there was no practical experience. The first notable attack by the German aircraft on a British fleet was when a damaged submarine was being escorted back from Scandinavian waters. It was in that action that the Germans claimed to have sunk the *Ark Royal* with a bomb. In actual fact the bombs did no harm of any sort to our warships, while some of the German machines were shot down. Our first air attack on moving German warships, which took place on September 29, was no more successful. A squadron of Hampdens set out in two flights of six to bomb German destroyers. One flight returned intact. In the other flight one machine soon flew home with engine trouble, but the remaining five disappeared, and for a long time no authentic news was heard of them. After three months a survivor who was a prisoner of war sent home some account of the action, and this has now been made public. "I saw our squadron commander's machine dive in flames straight into the sea," he wrote. The flight had been attacked by 19 Messerschmitts. The letter continued: "They, together with the anti-aircraft guns, poms-poms and flaming onions from the destroyers, finished us. All of us were set on fire by tracer bullets, and those who survived the actual bullets and heat had from two to seven hours in a very rough sea. Two of us had an hour of it, another had three, whilst I was in the water for six hours."

However, this flight gave a good account of itself. The Italian wireless which announced the rescue of four British survivors also said that three German airmen had been picked up from the sea, which means that at least that number of Me 109 fighters had fallen to the guns of the Hampdens. Since that disastrous day that squadron has made over 440 raids. Our consolation must be that had both the German and the British bombing attacks on the hostile fleets been completely successful, Britain would have lost heavily on the deal—in fact, she might have lost the war.

The "Brazen's" Last Fight

AIR Bombs have, in fact, sunk very few moving warships on either side, and most of the victims (if we rule out trawlers and other slow-moving and ill-armed craft) have been destroyers. One of the latest to fall to air bombs was H.M.S. *Brazen*, a destroyer. When she was attacked she shot down three German bombers, but finally was hit herself. She was taken in tow, but sank before reaching harbour. There was no loss of life on board. In another engagement her sister ship, H.M.S. *Beagle*, shot down a Junkers 87 dive-bomber with pom-pom fire. These multiple pom-poms are certainly the right answer to dive-bomber attacks, but only the Navy possesses them.

Neutral merchantmen naturally cannot defend themselves against the German bombers, and within the last few days there have been two bad cases of German aircraft murdering neutrals. One was the *City of Limerick*, belonging to Eire, which was sunk by bombs on July 11, a hundred miles from land. Only four days before a German broadcaster at Bremen had said that "Germany is only interested in the maintenance of the absolute and unreserved neutrality of Eire." The other case was that of the Panama steamer *Frossoula*, which was sunk on July 15. Eighteen of her crew left in two boats. One boat has reached a British port with only three men left alive in it. Nothing has been heard of the other boat.

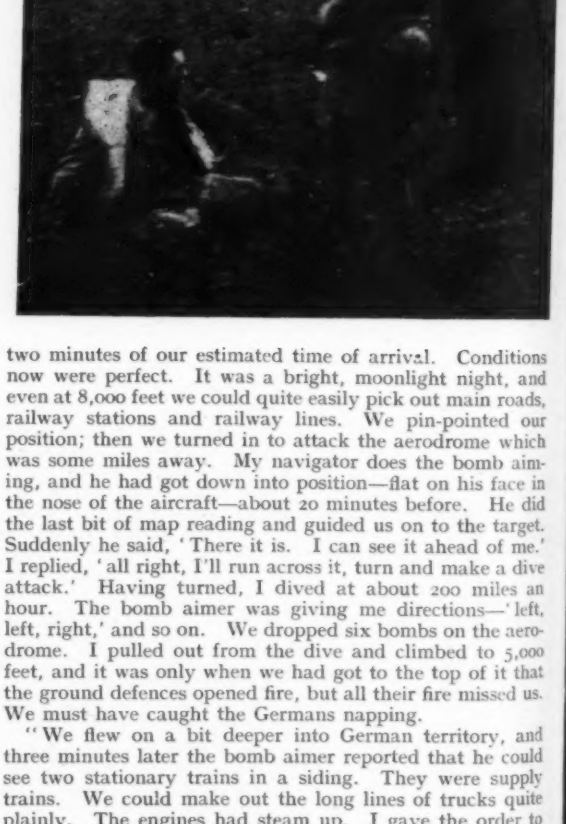
RIG OF THE DAY: Steel-helmeted sailors on the look-out for enemy aircraft while an escort of Spitfires passes overhead. Note the high-angle guns at the ready.

The Navy has taken some revenge for these losses. On the morning of Saturday, July 20, Swordfish T.S.R. machines of the Fleet Air Arm paid a visit to the Italian naval base at Tobruk. One bomb scored a direct hit on an oiler, and this was followed by a heavy explosion. Other hits were scored on transports and supply ships. Tobruk has been bombed more times than we remember, but each raid seems to find some worthy target there. Obviously it is not easy to put a harbour out of action by air bombing. Two days later, on Monday, July 22, Skuas flew to Bergen, but found the weather so bad that they could not do all that they had wanted to do. None the less, they sank a Flak ship and bombed the seaplane base. The Germans have not as yet got any pom-poms, so the dive-bombers scored a bull or two.

Haifa has suffered a second air raid, and this was more destructive than the first. Twelve Italian bombers flew over on Wednesday, July 24, and killed 46 and injured 88 people. The official news agency in Rome has reported that the "Rome area" was raided on the night of Tuesday, July 23, when two people were killed and four injured, but no R.A.F. machines have flown over Rome at all since Italy entered the war.

A very gratifying feature of a recent raid on Germany was that some of the French airmen who have joined the forces of General de Gaulle took part in it. A reporter of the *Daily Telegraph* interviewed them on their return and gave the following account of what they told him. In this raid they flew in machines with British airmen. They expressed great pride in being parties in such a collaboration. "Nos confrères Anglais," one of them said, "sont

WAR IN THE AIR (CONTINUED)



TAKING IT SITTING DOWN: A Dornier 17M destroyed by a Hurricane during a recent raid on this country. The member of the crew sitting on the grass looks rather as if he never knew what hit him.

merveilleux." "Epatant!" added one of his colleagues, indulging in the highest of colloquial praise.

"We were aware before," said the third, "of the prowess of the R.A.F., but on this raid we had first-hand evidence of the high efficiency of its personnel, of the excellence of its equipment, and of its wonderful navigating skill."

The principal objective of these planes was an aerodrome. They dropped bombs on hangars, in which fires broke out. "Our British companions," said one of the Frenchmen, "knew some French; we knew a little English. On approaching the aerodrome we exchanged some words in English, some in French—and, of course," he added with a smile, "we tried on our side to help with some gestures. The result was satisfactory, for each knew exactly what he had to do, and everything was carried out as planned."

Another satisfactory episode has been the dropping of leaflets over France to counteract the anti-British propaganda which has been circulated by the Vichy Government of Marshal Pétain. A true account was given in the leaflet of the British action at Oran, which had been distorted by the Vichy clique. Another leaflet has also been given to all Frenchmen who return to France, urging them to remember that "The British continue to fight to re-establish France with all her historic and traditional greatness."

"A Satisfactory Trip"

OUR bombers have continued to make widespread attacks on military objectives in Germany and the countries occupied by the enemy, while the Coastal Command has evidently taken the oil stores in Holland under its wing. The official reports are deplorably lacking in interest—not that we would wish them to be couched in "journalese"—but one can get a good idea of the work done from a broadcast made by a Flight Lieutenant, a New Zealander, describing what he called "the most satisfactory trip" he has had. He said: "As a matter of fact this was my 21st raid. We took off at 9.30 at night in a fading light and set course for Germany. Ten miles off the Dutch coast we ran into really filthy weather. We had been warned to expect a heavy thunderstorm—and, sure enough, there it was. Dead ahead of me I could see huge black clouds like a gigantic curtain across the sky, and flashes of lightning. We climbed to 12,000 feet to get above the storm. At that height we were flying in and out of the tops of the clouds; below us all the time it was pitch black. These conditions extended to 50 miles. Then we ran into clear weather. I checked up on my position and found that we were just a few miles north of our intended course. We reached our first objective—an aerodrome in the Hanover area—within two minutes of our estimated time of arrival. Conditions now were perfect. It was a bright, moonlight night, and even at 8,000 feet we could quite easily pick out main roads, railway stations and railway lines. We pin-pointed our position; then we turned in to attack the aerodrome which was some miles away. My navigator does the bomb aiming, and he had got down into position—flat on his face in the nose of the aircraft—about 20 minutes before. He did the last bit of map reading and guided us on to the target. Suddenly he said, 'There it is. I can see it ahead of me.' I replied, 'all right, I'll run across it, turn and make a dive attack.' Having turned, I dived at about 200 miles an hour. The bomb aimer was giving me directions—'left, left, right,' and so on. We dropped six bombs on the aerodrome. I pulled out from the dive and climbed to 5,000 feet, and it was only when we had got to the top of it that the ground defences opened fire, but all their fire missed us. We must have caught the Germans napping.

"We flew on a bit deeper into German territory, and three minutes later the bomb aimer reported that he could see two stationary trains in a siding. They were supply trains. We could make out the long lines of trucks quite plainly. The engines had steam up. I gave the order to attack. The navigator guided me round, and we then carried out another dive attack. The searchlights had been trying, unsuccessfully, to pick us up, and as we started to dive the anti-aircraft guns opened fire. Tracer bullets were coming up all over the place. As they couldn't see us they seemed to be spraying it round the sky, hoping for a lucky hit. We dropped our bombs, and the tail gunner reported unusually heavy explosions, so we decided to take a good look. As we circled I could see the explosion breaking out along the trucks, one after another down the line, with green, blue and yellow flashes. They continued for over ten minutes—to our intense satisfaction.

WAR IN THE AIR (CONTINUED)

I must say—and fires broke out which we could see from 30 miles distant on the way home.

"Coming back, as we passed over the aerodrome which we had bombed earlier, the second pilot reported three Messerschmitt 110's diving down on our starboard side. I immediately started to dive too. They were about 400 yards from us when the light anti-aircraft batteries from the ground opened up. The fighters, in danger of being hit by their own guns, sheered off, and we didn't see them again. That wasn't quite the end of the show. Over the Meuse the front and rear gunners had a shot at a group of four searchlights which were looking for us. We were down to 1,500 feet at the time. I saw the front gunner get one of the lights. There was just a small flash, then the light went out. The rear gunner reported that he had put one out of action too.

"That finished our little bit of excitement. Dawn was breaking as we crossed the English coast and it was daylight when we landed."

The Havoc of our Bombers

THOUGH we have no doubt at all that our raids are doing much to hamper the war effort of Germany, it is gratifying when confirmation of this can be got from a neutral source. A Turk who has recently visited Hamburg, Emden, Bremen, Dusseldorf, Cologne, and Essen, has returned to Istambul (Constantinople) and has reported that hardly a factory in any of those cities remained intact. Hamburg port, he declared, was in ruins. In some cases bombs had fallen down factory chimneys. "It is clear from what I have seen," he said, "that only military objectives are being attacked. The majority of the civilians have been evacuated. The Nazi authorities are doing everything they can to prevent news of the damage caused from spreading to other parts of the country. People in Berlin know little about it."

But, of course, our bombers do not have things all their own way. We lose some machines, but our losses are nothing like so heavy as those of the Germans who raid Great Britain. The following story was told by a Squadron Leader who got back from a night raid on Bremen with one engine dead and the other not giving proper power.

"Fragments from the barrage," said the Squadron Leader, "hit the radiator and the port engine conked out. The remaining engine wasn't giving us enough pressure to maintain height, so we laid a course for home. We jettisoned our bombs over the target and turned for home with mighty little hope of reaching a friendly shore. Losing height steadily, with a good 250 miles still to go, we lightened the aircraft by chucking out every movable thing on which we could lay our hands except, of course, the parachutes and collapsible dinghy. We were nursing the good motor, but as it was not giving us all we wanted we chopped the door off just in case we hit the water suddenly. We were down to 400 feet, and there we stuck, for longer than was comfortable, wondering when we would hit the water. But Providence was good to us, and the motor picked up again and gave us nearly as much as we hoped for. We had taken a pretty good pasting from the anti-aircraft guns because we had been silhouetted against low clouds, and we counted ourselves fortunate when we saw the shores of England looming up. Everything had gone overboard—guns, ammunition, accumulators, parachute flares, bombs and oxygen bottles—which, by the way, made a good bang when they hit the sea. That was what really brought us home. We hit the coast with nothing to spare, and we crawled back with a few holes in the aircraft to an aerodrome, where we were welcomed with a breakfast for which we were all thankful. I remembered the scramble eggs."

German bombers have continued to make more or less sporadic raids on Great Britain every night and most days. It is now established that the Heinkel 113 fighter is coming into use, and another new but not unexpected phenomenon is the appearance of the Me. 110 as a bomber. It was always known that this type could be used as a light and fast bomber, but it is not expected to be very efficient. Its chief recommendation from the point of view of its crew is that it is fast, and should give them a better chance of escaping from a Hurricane if it starts in good time. The Me 109 has also been used as a bomber. We have also shot down a Vought-Sikorsky V 156 dive-bomber which the Germans had taken from the French. These apparitions do not necessarily mean that the Germans are running short of standard bombers, but they may mean that the air crews are anxious for machines which give them a better chance of surviving than is afforded by the He. 111 or even the Ju. 88.

Of 33 air-raid casualties in two towns recently 20 occurred in the open and only 13 in buildings; 17 were from flying glass and six from bomb splinters. This analysis was given by Sir Alexander Rouse, Chief Engineer to the Home Office, in a broadcast. He emphasised the importance of taking cover and of avoiding flying glass. He said that he was astounded to find that many people had not covered their Anderson shelters properly. In one recent case, a bomb caused injury from splinters to six occupants of a shelter which had no earth covering at the back, but occupants of properly protected shelters near bomb craters had escaped. One explosion pushed the last man into a shelter, which was telescoped by the force of it. But, as it was well guarded, there were no casualties. Results had also been satisfactory from brick-and-concrete shelters and trenches. Houses gave useful protection.

Six Against Eighty

IN our last issue we mentioned the heroic way in which six Hurricanes tackled eighty enemy aircraft. The Squadron Leader who led them has now given an account of the fight. "It was like looking up at the Piccadilly Circus escalator," he said. He could see tier upon tier of Nazi aircraft, stepping thousands of feet up into the sun. "It was a terrific scrum," said the Squadron Leader. "The six of us were split up into two formations of three. As we were flying across the bows of the convoy, the pilot leading the second formation which was flying above us called me on the radio telephone: 'Huns ahead.' I looked

GETTING PLENTY OF PRACTICE: A German single-horn sound locator which is operated by a crew of two. One looks after traverse and the other after elevation.

WAR IN THE AIR (CONTINUED)

up into the sun and saw the enemy rising in tiers as far as the eye could see. Eighty of them. The situation looked pretty grim. The best that we could hope for was to upset them a bit. We did. I ordered my formation into line astern. The enemy bombers were just about to dive on to the convoy. I decided to attack from inside the circle of bombers—they were circling all the time—and flew to a point where I judged they would begin their dive. As the Dorniers attacked I singled out one and gave him a short burst. I had to pull away immediately because I was in close line abreast with the following Dornier. I came in again to attack another Dornier, and had just opened fire when tracers started whistling past me. I took immediate evasive action. Then my starboard aileron got a terrific crack. It partially jammed, making my Hurricane difficult to control. There was nothing for me to do but beat it home. I don't know what happened to the two Dorniers I attacked. There were too many Huns about to wait and see. They were diving one after another on to the convoy. The ships were blazing away at them. It was a show, all right."

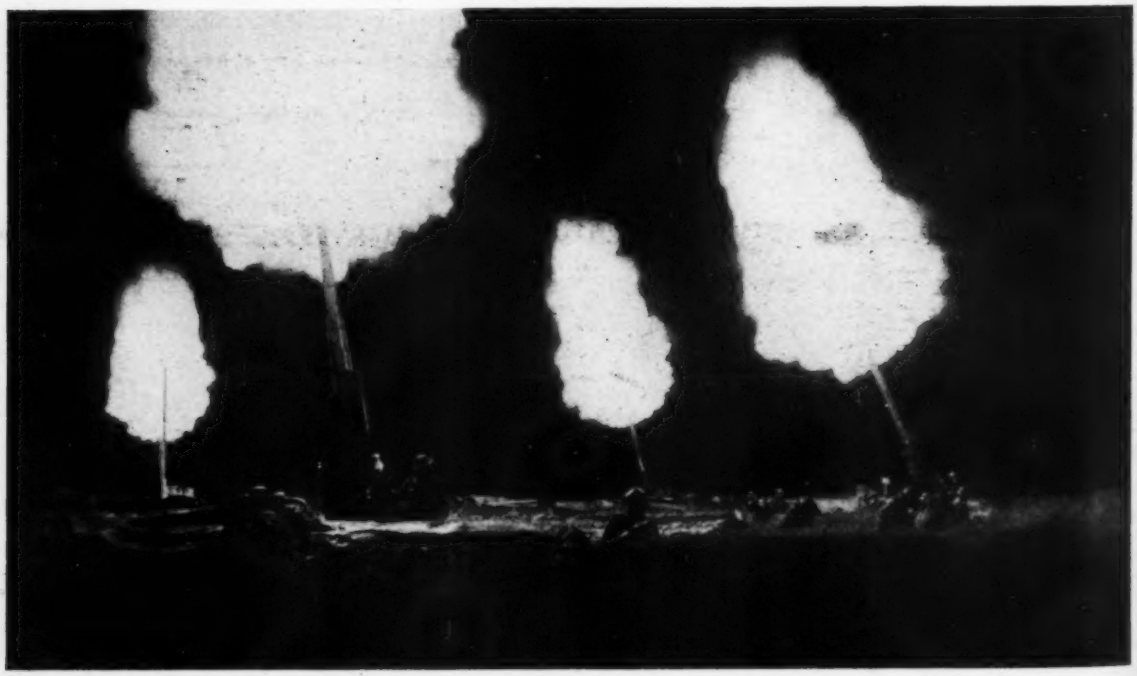
"Immediately I saw the Messerschmitt fighters," said the pilot who was leading the other three Hurricanes, "I warned the Squadron Leader who was flying below me. As my formation flew to engage them I saw five enemy fighters trying to form a defensive circle. I closed in and had a crack at the nearest one, giving him a short burst. He staggered, and I saw his port aileron come off. He went into a spin and I broke away. A few seconds later I saw him crash into the sea. I came in again to engage another Messerschmitt, giving him three bursts. Fragments came away from his wings and fuselage. He started to slip to port. Then he turned over on his back and I saw him going down, but I couldn't watch him, because out of the corner of my eye I saw two more Messerschmitts diving on my tail. I gave them the slip, and dived to engage a Dornier which was trying to get into a defensive circle of ten other Dorniers. As I came in to attack my windscreen suddenly went black with oil. I broke away. I could not see a thing. The Dornier was firing at me. One bullet hit my port head lamp. With oil streaming over my windscreen I was no more use in the fight, so I returned to base."

Raids on Malta continue, but the place still carries on its activities. On Sunday, July 28, the Gladiators there shot down four Italian bombers. About 100 raids have now taken place, and the Italians have lost 21 machines, while we have only lost one. The Vice-Admiral, Malta, has received a telegram from the Admiralty expressing their admiration of the stout-hearted way in which His Majesty's ships and dockyard face the continued enemy air attacks. The telegram adds: "The gallant endurance of the Maltese personnel and the Maltese citizens generally ever since the outbreak of hostilities commands universal respect. The good work done by the volunteer dockyard battery must be as great a source of gratification to you as Vice-Admiral, Malta, as of pride to the officers and men forming the gun crews."

The Germans claimed to have sunk 11 ships totalling 43,000 tons in an air attack on a convoy in the English Channel on July 25. The facts are that 21 small coastal vessels were being escorted by H.M. trawlers when they were attacked by numerous German aircraft. Five small ships, totalling 5,104 tons, were sunk, and five others, of about the same size, were damaged. One, of 554 tons, had to be beached. Still, this was in a way the most notable success which the *Luftwaffe* has yet scored against a British convoy.

A German auxiliary ship with a naval ascort was located in the North Sea one night, and early next morning T.S.R. *Swordfish* went out to attack. One of the German naval ships, an escort vessel of the *Konigin Luise* class, was hit by a torpedo. All our aircraft returned.

Thursday, July 25, was the best day to date for our fighters and A.A. guns, for in the course of the day they shot down no fewer than 28 Germans over Great Britain or off our coasts. At least nine of the victims were German fighters. The next best day to date was July 20, when we destroyed 23. The total of enemy aircraft destroyed in raids on this country since September 3 is now 288.



ALL TOGETHER : A battery of British 3.7 in. A.A. guns in action at night.

"ANY EVENING, ANY DAY"

A Story of Bomber Command Work Round the Clock

(Above) In pilots' rooms in Bomber stations all over the country squadron commanders "brief" air crews for the night's work. That is to say they are told off for the various targets and time-tables are organised.

(Left) Captains of aircraft and navigators then lay out their courses with the aid of rulers, dividers and course and distance calculators. Note the bubble sextant on the nearest corner of the map.

(Right and below) Meanwhile whichever type of aircraft is being used for the job in hand, Whitley, Hampden or Wellington, the ground crews are busy loading up bombs, rearming gun turrets and giving engines and aircraft a final look-over.

"ANY EVENIN

(Top and centre right) With engines warmed up the crew—five in the case of a Wellington or Whitley—get aboard ready for the take-off The picture of an air gunner emplaning on a Hampden shows clearly the twin Vickers K guns and the armour plate protection against enemy bullets and flying shrapnel.

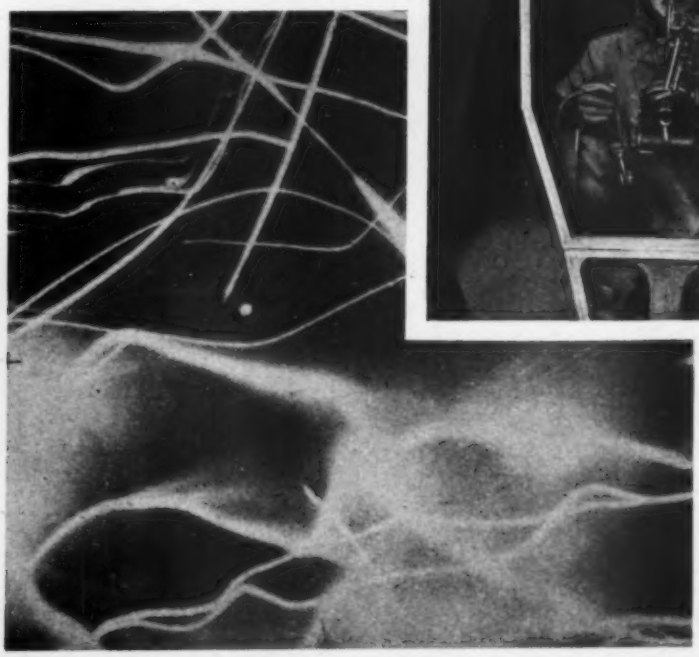
(Centre, left) Night bombers usually fly alone, the time-table arranging for any concentration which may be thought necessary, but sometimes ways are together for a while and company is pleasant over a long sea trip.

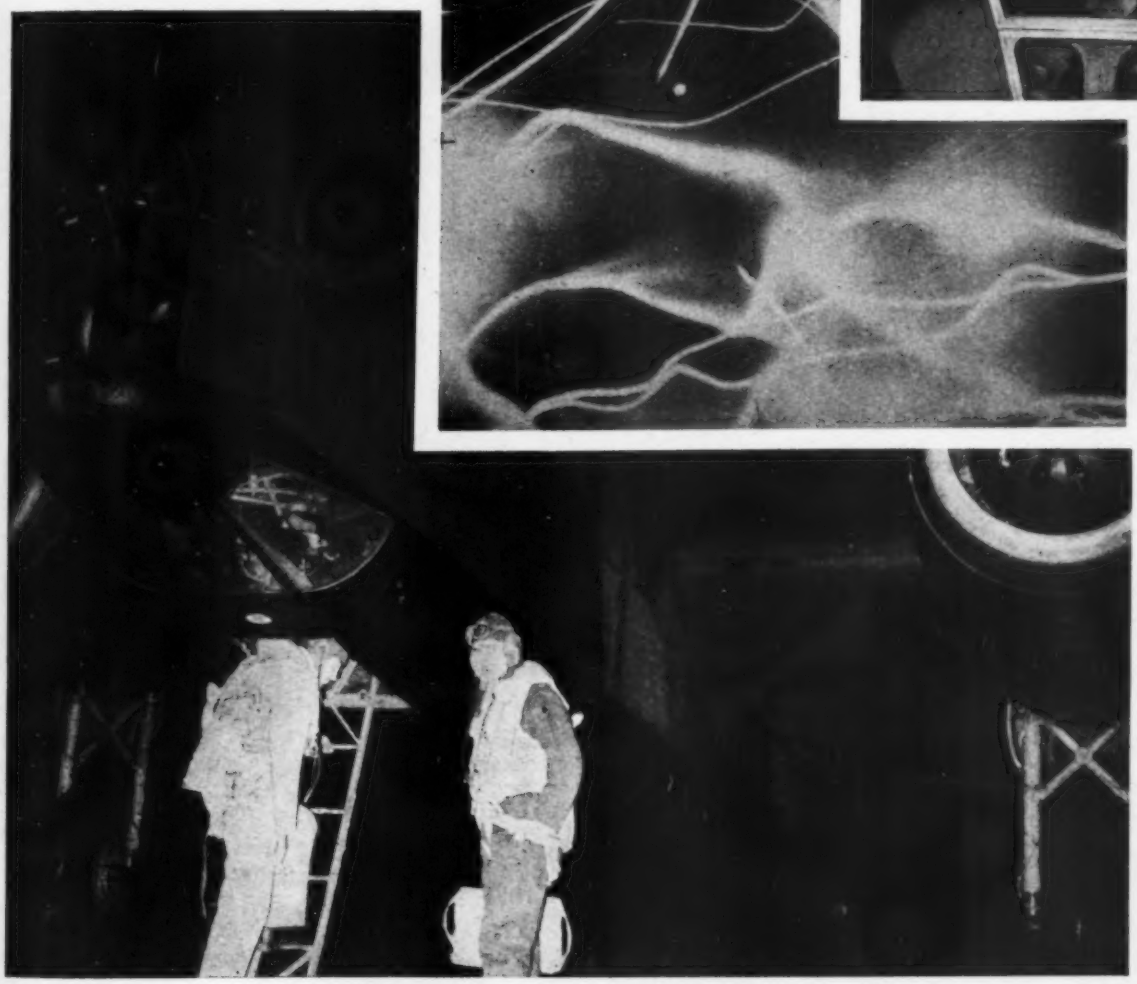
(Right) On the way over navigation must be checked and rechecked so that place and time must coincide exactly. Time of arrival over the target, perhaps seven hundred miles distant, is often within two minutes of the time laid down.

(Left) As hostile territory is approached the rear gunner is constantly alert for enemy fighters, but these are seldom met with on night raids.

ANY DAY" (CONTINUED)

(Right and top) Over the target area at last after "soldiering" a way through a "Brocks benefit" of flaming onions, shells, tracer bullets and searchlights. The bomb aimer releases his missiles and, usually with a few holes in various places, the machine is turned for the wearisome drive back home



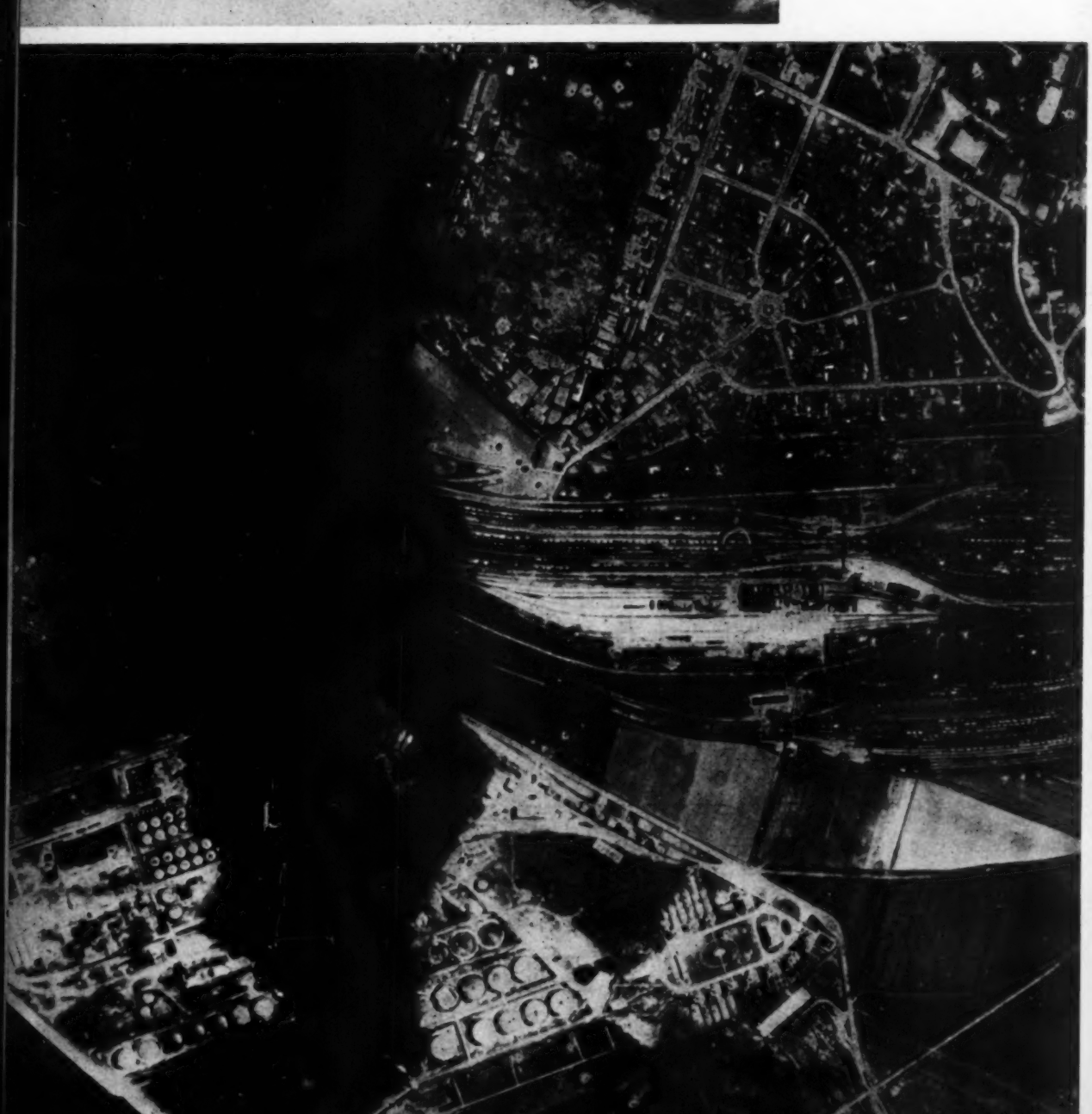


(Above and right) Back at the 'drome legs can be stretched after hours of cramped sitting, parachute harness and Mae Wests removed. Later a glass of beer and a cigarette can be enjoyed as the crew recount their experiences to an Intelligence Officer.

(*Concluded overleaf*)

"ANY EVENING, ANY DAY" (CONTINUED)

The next morning a reconnaissance machine equipped with cameras makes its way to the target, using such cover as the clouds afford, and photographs the damage done the night before, frequently with the result shown below when oil storage has been attacked.



Air Strategy XIII

AIR BLOCKADE—III

An Ever-tightening Air Blockade Can End the War Sooner

By CAPT. NORMAN MACMILLAN, M.C., A.F.C.

NOT only Germany but many of the countries she now dominates are strategically open to air blockade, while, from the air, the sea stranglehold which has been placed about Italy can be more tightly drawn and knotted at the top end.

Under the policy which ruled during the earlier months of the war, air blockade was impossible. Bombs were dropped on isolated naval and air targets—places like Kiel and Sylt. But the bombing of the manifold targets that must necessarily enter into a plan for air blockade was taboo. Until the invasion of Norway altered the whole picture, Britain's war in the air (in spite of the object lesson in Poland) was repressed by the inhibitory political outlook upon the employment of the bomber.

The tragically brief campaign in Norway changed all that. The latent power of the R.A.F. was then allowed to have more scope. The farcical leaflet raids faded into a memory of a new form of operational training in navigation. The way was opened for the application of air blockade. Tentatively it was applied by an occasional raid; recently it has been intensified. More, much more, must be done. As the R.A.F. and the Dominion air forces grow in numbers it should, eventually, become possible to cut Germany's communications with the outside world and to isolate her troops in the countries which they have occupied. To do this entails the building up of a vast air force, able to dominate the whole of Europe. And there is no reason why such a force should not be created in spite of the wastages of war, and in spite of the present numerical superiority of the *Luftwaffe*. And, however much it costs, it will be the cheapest contribution to the winning of this war.

Sea and Air Blockade

Let us look into some details of the manner in which air blockade can be designed to reduce the power of Germany. It must be acknowledged that air blockade is less forthright than sea blockade. But its effects upon the population are more immediate.

Sea blockade means the prevention of the entry and egress of sea-borne supplies. While the oceans are wide, the sea approaches to landfall are not wide; sea supremacy must first be secured, thereafter unceasing vigilance upon the waters maintains the blockade.

Plans for sea blockade, once set in motion, are more stable than are plans for air blockade. Intelligence reports of the movements of ships from ports ought to be more readily obtainable than reports of the internal movements of supplies within the frontiers of a State with whom one is at war.

At sea it is enough to seize the ship. By air it is essential to destroy the internal distribution—or, at least, seriously to derange it—so that the regular life of the separate communities which comprise the State is broken up, and the various parts are thrown back on the attempt to become self-supporting.

Sea blockade is impartial. It strikes by withholding. Those who apply it do not visit their victims. Air blockade is direct. Its blows kill and maim a proportion of its victims.

Sea blockade affects the whole nation blockaded. Air blockade might be so applied as to affect certain sections of a nation, sections which might be selected on account of their geographical situation, or by reason of their employment, for either particular areas or particular industries can be attacked from the air.

Air blockade might be employed in such a way as to cause internal disruption in a country by the excitement of some of the human passions. Envy, for example, than which there is none more latently widespread. Air attacks might well be used to arouse envy of more safely placed citizens among groups of persons singled out for especially devastated attacks. One has already seen the symptoms here in Britain over the evacuation of children overseas. To arouse envy is a good card for an enemy to play. So it is necessary for a Government to see that when it is played it does not succeed. War and revolution stalk hand in hand. And it is no less than a German revolution that Britain has pledged herself to secure by the overthrow of the Nazis by force of arms. Skilful use of Britain's air arm might achieve this end earlier than clumsy handling of it. Indeed, such an end might well be made the main strategical conception of the employment of the R.A.F.

Detailed Knowledge Necessary

How is an effective air blockade to be devised? To begin with, it is necessary to know a great deal about the internal economy, industry and distributive systems of the nation to be blockaded. While many of the internal activities of a nation are affected by war, the changes are notably more apparent in the administrative sphere than in the operational. The mere formation of a central Ministry does not alter the situation of a factory, the routing of a railroad, the position of a warehouse. The purpose of most War Ministries is to apply national and regional planning in place of purely commercial planning, which latter follows the law of supply and demand, and is subservient to it. War Ministries refuse to acknowledge this law, and employ artificial means to evade it; for example, control of prices, rationing of foods, prohibitions of sales of restricted articles, requisitioning.

But none of these artificial wartime devices do much to change the fundamental bases of industry and commerce. Thus, a knowledge of the pre-war industrial and commercial organisation of a nation provides a sufficient basic pattern upon which to draw up a scheme for air blockade.

Before war begins, such knowledge is readily to hand in many forms. The ban upon disclosure of vital information which is the immediate consequence of war is, to the air strategist, simply a closing of the door after the horse has gone.

In times of peace every nation is proud to advertise its goods. Great national newspapers run special supplements describing cross-sections of the nation's industry. Two years ago *The Times* issued a special Iron and Steel Number, which, with its map, diagrams, photographs and articles, offered the Intelligence Departments of the world a marvellous amount of information for twopence. Such a publication would never be permitted to-day. Yet

AIR BLOCKADE (CONTINUED)

the iron and steel industry cannot have altered so very much in two years, except by expansion of plants. And it is the job of the agents of Intelligence Departments to find out what changes may have taken place. But to-day, with the perfection of stereoscopic air survey photography, much of the ground agents' snooping work can be cut out. For example, who took the photographs upon which the R.A.F. raid on the Dortmund-Ems canal was planned?

Information Available

But it must not be imagined that I suggest that Britain has been more lavish in presenting special folios of cheap information to the Intelligence Departments of foreign countries than have other nations. Germany, in spite of all her precautions, has done the same. And for the identical objectives—instruction of her own people and advertisement of German industry at home and abroad.

One grand cheap packet of information about the background of the *Luftwaffe* and the German army and navy was produced. This lavish production of more than 300 pages contained a mine of information about the German Services and their industrial background. The front cover showed the whole industry, husbandry and motherhood of the nation grouped figuratively behind a German soldier in steel helmet and grasping a rifle. The advertisement pages conveyed even more useful information than the text. Most of the important firms behind the three Services advertised in that number, and in their advertisements, as is usual, they stated what products they made and where their works and offices were situated. One advertisement (to take but one example) included a photograph of the German *Kraftfahrtruppen*—the motor cycle sidecar troops—whose work in the invasion of Western Europe seems to have come as a surprise to many of the British public, even the usually well informed. A vast number of those motor cycle soldiers was shown drawn up along one side of a Berlin square. The formation in which they were drawn was obvious. Their strength was clearly depicted. In the text an artist's impression of one of the units in action during manœuvres showed the armament they carried. The advertisement said who built the motor cycles. How much more information could any intelligent Intelligence Department want?

Factories as Targets

What questions would *you* have asked after seeing those illustrations? Which factory would you send aircraft to bomb if you desired to slow up the output of motor cycle combinations for the German army? To make sure, aerial reconnaissance photographs of the plant ought to show the buildings from which motor cycles are being delivered; at some stage of their construction, or during their testing, it should be possible to confirm that the article sought is the produce of some particular plant. Then the raid could be planned. Such is one of the available sources of information needed by the Intelligence Department. Supplementary information might be required. Are other factories also making the same article? If so, which? For such extensions of information other sources would have to be tapped.

Then, again, each industry has its own trade journals, whether it be the aircraft industry, the chemical industry, or the industries connected with foodstuffs. Before the war all trade journals contained information of vast importance to a prospective enemy. So did many local journals, whose pages usually have more room for details of localised activities.

Many of the great manufacturing and distributing organisations issued regular literature to describe their products, plants and the uses of the goods they made. Much of this literature was distributed free to anyone who applied for it. Which merely shows that the machinery of peace and the machinery of war are the antithesis one of the other. That is why war, of itself, solves no problems; the problems remain. What is satisfactory in war is not necessarily satisfactory in peace. And vice versa.

In industry there were many international associations with, in peacetime, meetings of delegates of different countries to decide questions of policy for the industry as a whole. There were such associations between British and German trade. What is the position of such associations now? Do the delegates of each side respect the confidences that must have been imparted to them during many friendly meetings with delegates of former friendly, but now enemy, companies? Do they keep the information they possess to themselves, or is it available to the Intelligence Departments of their respective countries? Does business override war, or does war override business? Is there an incentive to bomb the enemy factories, or to shield them because of old So-and So? These are difficult problems, and they must affect air blockade if they carry too much weight.

No Exceptions

In war, this modern total war, there can be no exception. Whatever is important as an asset to the enemy's power of continuing the struggle must be swept away. And the only way open to Britain to sweep away the power of Germany at present is the power of a combined sea and air blockade.

Most of the Air Ministry and Ministry of Information reports state the neighbourhoods in Germany which are attacked. Occasionally the kind of factory is mentioned, sometimes its name is given, as, for example, the Focke-Wulf aircraft works at Bremen. But there are lots of places where only the town is mentioned, as Mannheim, Frankfort, Dortmund, Altona, and so on. I do not suggest that there is any need to give more detailed information. The public generally is probably not deeply interested in what kinds of factories are bombed, except perhaps when they are aircraft factories.

But without precise information as to the factories which are attacked it is difficult to form an opinion about the strategic aim of the attacks; they might be part of a general plan of air blockade, or they might be devised to limit the effectiveness of some sections of the German armed forces in the air, on the ground, or at sea. From the information which has been made available, the opinion I have formed is that they are intended more as specific military operations which fall into the second category rather than as parts of a strategically conceived plan of air blockade.

If I am right, then one must assume that the R.A.F. is being wielded as an old-fashioned weapon was used against the military forces of the enemy, albeit in the more modern way which the air makes possible, by attack at the sources of the manufacture of certain munitions. This is not what is required by air blockade. Air blockade must apply the same principles as that of sea blockade. It must withhold impartially from the whole nation blockaded. It must be used as a means of siege, not as a means of combat directed solely against troops.

Something in the way of siege has been achieved in the holding-up of trains carrying food from Holland to

AIR BLOCKADE (CONTINUED)

Germany, but that seems almost to have been incidental with attacks designed to prevent the passage of munitions from Germany to Holland over the same lines.

And there are so many targets which have not been attacked at all. There are so many aircraft factories, and aero engine factories, which seem not to have been singled out for bomb attack, as to make one wonder wherein lies the reason for their exemption. Is it that they are more distant from British air bases? Or is it that a certain number of other targets are more urgently vital at the moment?

One thing is certain. We lost a valuable opportunity of taking action against certain targets while we had bases in France from which to operate. In an earlier article I dealt with the relative distances from bases in Britain and France. It was only too obvious that Britain as a base was advantageous only when attacking a relatively small area in North-west Germany. Yet the chance of using French bases for attacking vital targets, such as exist in Bavaria, Saxony, Silesia, Brandenburg and Prussia (east of Berlin) and Pomerania was not taken advantage of.

Now that every target in Germany has to be singled out from bases in the British Isles, and that it may be necessary, in addition, to attack military objectives at any point on or behind the 2,000 miles line (as an aeroplane flies) from the bay of St. Jean de Luz to North Cape, the specifications for British military aircraft for purely offensive operations need considerable recasting —and no doubt have already received such attention. Perhaps therein lies the interpretation of the Prime Minister's statement in his last broadcast, that we should not be ready to take the offensive until 1942.

But in the meantime we can proceed with a plan of air blockade within the compass of our present capacity in air strength and aircraft performance. Added to our sea blockade, it would have a valuable effect in helping to reduce the duration of the war. In my next article I shall consider some of the aspects of the actual application of such an air blockade.

NEW PLASTIC PATENT

Basket-weave Material Embedded in Synthetic Resinoid

PARTICULARS of the patent of what appears to be a new development in the world of plastics has come to our notice. It is referred to as a "compound sheet material for the construction of aircraft and land and water vehicles," and is covered by British Patent No. 505,811 and U.S.A. Patent No. 2,126,711.

The new patent is described as sheet material for constructional purposes comprising a core of interwoven members which are embedded in a plastic. The interwoven core is made of ribbons or thin strips of relatively stiff, resilient and form-retaining material such as wood or metal, coated before interweaving with a cellulosic thermo-plastic.

After interweaving, the core is embedded in additional thermo-plastic and pressed out into sheet form and caused to set. The specification says that preferably the strip material is wood, while the thermo-plastic may be cellulose acetate. Strips of mahogany, one inch wide and one-forty-eighth inch thick, are mentioned, and the thickness of applied thermo-plastic may be about half the thickness of the strip, that is, about 0.012 inch. If the wood ribbon is immersed for 30 seconds the plastic adheres, but does not impregnate it, particular attention being drawn to this fact.

Advantages Claimed

The claims for the material are very broad in scope, and the product covered may be advantageously employed in many fields, including the construction of fuselages, wings and other parts of aircraft and the hulls of speedboats.

The material is said to be immune to corrosion, to be waterproof, and highly resistant to fire. The flexibility of the woven core enables the product to be bent or curved to shape as desired. It is thought that this development may possibly revise the idea held by many engineers regarding the possibilities of plastics in highly stressed work.

Though relatively light in weight, this compound sheet attempts to combine the strength properties of woven fabrics with the rigidity of plastics, offering thereby considerable resistance to the tensile, crushing or other disruptive stresses to which it might be subjected in use.

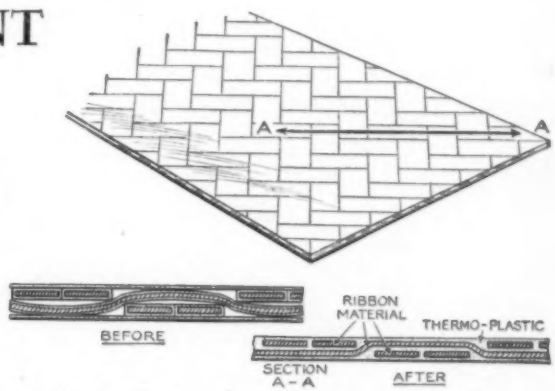
From experience gained for some years by licencees in U.S.A. it is claimed that it has now become possible:

(a) To turn out on mass-production lines airframes or speed boats in about one-tenth of the man-hours usually consumed;

(b) To obtain a considerable reduction of weight, without reduction of strength;

(c) To make the surfaces of such structures very smooth; and

(d) To produce the structures at very low cost.



These sketches show the interwoven strips, and a cross-section of the material, before and after setting.

From among people in U.S.A. who are said to have taken an active part in the development work are mentioned: Aircraft Research, Inc., of Bendix, N.J., and on the Pacific coast, the Timm Aircraft Company of Van Nuys, Calif., the noted flyer Clarence Chamberlain, who has taken aloft some of these planes from the Manchester, N.H., Airport, as well as the round-the-world flyer Howard Hughes, who has recently started experimental work on a large plastic plane.

While "armchair" speculation on a new material is of doubtful value, and strength tests are the only final criterion, it does look as though the material should have reasonably good tensile properties in the two diagonal directions. But whether the bends in the strips will adversely affect the compressive properties will have to be determined. The great advantage of the material lies in the fact that the thermo-plastic will allow sheets to be pressed into shapes, even shapes of double-curvature, after heating. The shear strength of the sheet will depend on the shear strength of the plastic.

The Dacre Engineering Co., Ltd., 18, Rastell Avenue, S.W.2, are authorised to arrange for the grant of licences in the United Kingdom and in Canada.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

VISIBLE VORTICES

Still More Examples

WITH reference to the article in *Flight* of the 18th instant on "Visible Vortices?" I have recently witnessed what was presumably a wing-tip vortex. It appeared at the port wing tip of a Hurricane which had gone into a steep dive in the course of its frolics with a similar machine. I should think the machines were at about 10,000 feet in a sky that was cloudless after a morning of heavy thunder showers. The time was about 7 p.m., and, as seen through binoculars, the vortex appeared as a brilliant white streamer about ten feet long, and of very brief duration. T. C. J. HELLIER.

Henley-on-Thames.

I HAVE read with interest your article "Visible Vortices." I have no doubt, from an experience of my own, that cloud will take on the form of objects with which it comes in contact. I was travelling recently near a seaside town where there is a balloon barrage. The morning was clear and bright, following a rainy night. Above the balloons were a number of clouds all of Zeppelin shape. My wife is an artist, so I drew her attention to this phenomenon and suggested she should paint a picture entitled "Balloons and Balloon Clouds." She said, "If I were to portray that effect accurately it would seem exaggerated!" HENRY W. WOODCOCK.

London, S.W.3.

I WAS very interested to read your article on the subject of artificial cloud formation in the July 18 issue of *Flight*, and venture to suggest that the following remarks may be of interest.

I have on numerous occasions been flying in aircraft at the actual time of formation of these cloud trails and have taken the opportunity of making fullest possible observations of the causes.

The trails may occur at practically any height, the essential details being a temperature slightly below freezing (and consequently a cold aircraft) and the presence in the atmosphere of regions of minute supercooled water droplets. These droplets are too small to be seen by the naked eye even at close quarters, but if struck by an airscrew, the temperature of which is below freezing, they consolidate, turn to ice and become a visible trail in the slipstream.

This is borne out by the fact that only one trail is observed from a single-engined aircraft, whereas a multi-engined machine leaves a trail from each airscrew.

There is no tendency for the trail to mix with the exhaust gases, as has been suggested, and the reason for the apparent turning "on" and "off" of the trail is the fact that the aircraft passes through alternate clear patches of air and regions occupied by the water droplets.

P. F. DUNHAM, F.R.Met.S.,
Pilot Officer, R.A.F.

Didcot.

I READ with interest your recent article on white sky trails, as I have frequently seen instances of these during the past year, over my home district in Oxfordshire.

The trails were all seen at a great height, except on one cold day in winter when the machine could be seen and heard, being perhaps some 10,000 or 12,000 feet up. The formation of the trails was generally associated with clear weather, and the presence of cirrus or cirro-stratus moving from the west.

One morning early this year—the first clear day after a spell of snow—I was able to gather some facts which, I would suggest, hardly square with the theory of propeller-tip vortices. The machine on this occasion was probably at about 30,000ft., since it traced a clear path through a patch of cirrus, leaving the blue sky visible beyond. The plane could barely be seen with glasses (X4) but was evidently twin-engined, since just behind the plane two distinct trails were visible, rapidly expanding, and blending to form one.

This rapid spreading of the trails immediately behind the plane, which must not be confused with the more gradual dissipation which follows later, seems to suggest that the exhaust gases, probably condensed or frozen, form the visible trail, since the expansion would be extensive at great heights, especially after supercharging.

A second point suggesting the presence of something other than condensed water particles, is the tendency of the trail to form rainbows while near-by clouds do not. On the day mentioned, one strip of trail lying roughly north and south, was carried along with occasional cirrus and eventually became indistinguishable from the cloud patches. When overhead, however, the trail, now much dispersed, formed a brilliant rainbow for some minutes, the red region being emphasised. Later, other scattered patches of trail, far away in the south, were also seen to give red refraction of the sun's rays, although neighbouring clouds gave no similar response.

One other fact I have noticed is that the trail may cease quite abruptly, even after continuing strongly for miles; this may indicate that the formation of the trail is artificial and under deliberate control. On the other hand if the trail is of natural origin, is it conceivable that a slight change of altitude or locality may unbalance the conditions responsible?

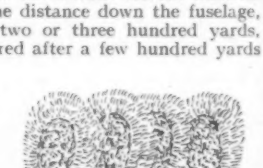
I can offer no exact theory for the formation of smoke-trails, but venture to suggest that these two facts—the immediate expansion on leaving the machine and the somewhat unusual refractive properties—point to something more than mere condensation at the propeller. I agree, however, that the shape of the trail does conform sharply to the helical vortex sheet traced out by a propeller. R. G. BULL.

Thame, Oxon.

HAVING read your correspondent's article on "Visible Vortices," I recalled a similar incident witnessed some months ago.

On Sunday, January 21, a Fairey Battle, cruising along at a height of probably 6-7,000ft., left a white stream behind it, definitely suggestive of helical vortices and tending towards a helical sheet as in the sketch.

I could not determine whether the stream started immediately behind the airscrew or some distance down the fuselage, but it extended uniformly for two or three hundred yards, trailed off suddenly and reappeared after a few hundred yards to extend for perhaps a third of the first length. Signs of the vapour (?) stream were still visible after 6 or 7 minutes.



From now on, of course, I assume this to have been a vapour vortex, as I ventured to suggest at the time, and I hope that I was not deceived by volumes of stannic chloride, or demanded apologies will undoubtedly follow for my cocksuredness. It seemed improbable that this phenomenon could have been visual signalling, for no R.A.F. station existed within several miles of the point of observation, which was on the outskirts of a large town.

The conditions under which this took place are as follows:—

Time about 10.30 a.m.

The air was very crisp and clear, mere traces of cloud being visible, probably between 20 and 25,000ft.

Over 30 deg. of frost were recorded during the previous night.

Ground temperature was below freezing point, despite brilliant sunshine.

By about 11.30, mist and cloud were beginning to form at the height about which the aeroplane seemed to be flying. The afternoon became more dismal and the sun's brilliance and sparkle were reduced to a dull glow.

Judging from ground conditions, the temperature at 7,000ft. may have been between 0 deg. and 10 deg. F.

In an attempt to solve this problem, I put forward the following possible explanations:—

(i) Moisture was undoubtedly present in the air at that height, although invisible, and its presence may explain the sparkle of the sunshine. It would seem, also, that these fine particles of moisture were accumulating to form a cloud and had moved into cloud formation. At the lower atmospheric pressure and low temperature, the particles may have been supercooled, requiring a sudden and powerful force, as that produced by an airscrew, to convert them into small particles of ice and thus form a visible vortex. If we consider the vapour, then to be in "invisible clouds," the explanation of the disjointed whisps of vapour would be that the plane flew through two such clouds.

(ii) Still maintaining the "invisible cloud" idea, moisture may have been collected on the airscrew and flung together as droplets in the slipstream.

CORRESPONDENCE (CONTINUED)

(iii) The exhaust may emit hygroscopic particles around which the vapour could condense.

(iv) After all my strivings to hit the right nail on the head, I cannot see anything wrong with the argument that condensation is caused in regions of low pressure, but I would suggest that the vapour particles might be pressed together in regions of high pressure to form droplets. Such regions no doubt occur immediately preceding the low-pressure regions developed by airscrews and wing tips.

As an example of this, a mason pours water on a stone to allay the dust and make it easier working. In a porous stone, the water is readily absorbed to give it a damp appearance. From a sudden blow of a chisel, drops of water may be flung a considerable distance, leaving the stone apparently dry where the chisel was applied.

(v) The vapour would remain visible for some time in this instance because of its low temperature.

Perhaps all the above possibilities have some bearing on the problem, but no doubt these explanations will easily be shattered by those of some "Met." expert, to whom, I think, we ought to turn for enlightenment. REX E. LAYCOCK.

Mickleover.

I HAVE several times noticed the clear white line left in the sky by aeroplanes flying at great altitude. These have always been on warm, sunny days, with patches of white cloud. What I think is very unusual happened recently between 12 and 1 o'clock. I was on duty during an air-raid warning when I distinctly saw one of these white lines, left, I believe, by a German machine.

The moon was just rising and the sky was clear, except for some patches of cloud. The temperature was cool, and the machine did not seem to be very high as it could be heard plainly. The trail lasted about half an hour. I wonder if anyone else has seen one at night. S. WALKER.

COMMISSIONS FOR INSTRUCTORS

Unfair Treatment of V.R. Personnel

I WAS sorry to see that recently *Flight* printed an advertisement offering commissions to civilian flying instructors as a bait for enlistment. It would seem from letters appearing in the Press during the last six months that many R.A.F. flying instructors are receiving a pretty raw deal.

In particular there are a fair number of men with considerable experience and ample educational qualification who were mobilised from the reserves, or who enlisted and were posted for instruction with the rank of Sergeant. Many were promised commissions months ago but have still heard nothing. Now, to add to their disappointment and sense of injustice, direct-entry commissions are being offered to instructors who probably have no more flying experience and who certainly have no service experience.

This seems a poor reward for the many Public School boys and others who gave their week-ends and evenings to Voluntary Reserve training for two or more years before the war and who have now been regular instructors for six months or more.

It is the opinion of many that every flying instructor should hold a commission to be in keeping with his job. If he is not suited to hold a commission, then he should not be instructing. Is there a delay in fulfilling promises because it is no one's particular job to suggest or approve commissions, in particular for V.R. Sergeants? ONLOOKER.

THE INVENTOR-DESIGNER

A Plea for Better Treatment

RECENT issues of your journal have had interesting articles regarding the two-stroke engine and the subject of developing inventions generally.

In my experience, development under such committees as seem to exist in this country is totally unsatisfactory.

Might I suggest a better line of attack would be to give the inventor suitable employment in the industry concerned and allow him to form a "development group" among his fellow-workers to work up the invention in their *spare* time, utilising plant when *this is idle*. The scheme would thus be voluntary throughout, and the "development group" could be repaid (together with the firm for the use of its "idle" machinery) after the war on a royalty basis.

Such a scheme could short-circuit the activities of the departmental heads which throng our engineering industries and whose main concern is to safeguard their own positions by keeping back the inventions of subordinates. To-day in many of our largest firms it is more than his job is worth for a draughtsman or designer to put forward an invention of any importance with the expectation of "seeing it through."

On the other hand, firms hold their men down too tightly to expect to get *good* inventions thrown in with the designer's day's work. For instance, an application to work up in my private time as my property, but with an option to themselves when completed, of the enclosed invention (a rotary type of two-stroke engine —Ed.) has just been refused me by my firm, although I have been with them only nine months, and some £500 to £1,000 had been spent by me privately in studying the subject before joining them. No time was spent on the subject during my employ with them, and it is not even in their line! I have, of course, cleared the matter up by giving in my notice, but that should not be necessary, these days particularly. A. W. CAPP.

Ilford.

INCREASED A.T.A. FERRYING ACTIVITIES : MORE PILOTS WANTED

AIR TRANSPORT AUXILIARY has recently had a great compliment paid it by the Air Ministry. In future, it is to perform all the duties of ferrying Service aircraft in this country, and as a result of this new responsibility, and of the greatly increased production of aircraft, more pilots are urgently needed. The number of flying hours needed as a qualification has been reduced from 280 to 150 hours. Every man or woman with that number of hours to his or her credit, who is physically fit, is a likely recruit, even if they have not a current licence.

In September last Mr. Gerard d'Erlanger, who is a member of the board of the Airways Corporation, formed a pool of 30 experienced civil pilots. These were attached to two R.A.F. stations and shared the work of ferrying bombers and fighters from factories to maintenance units. (When an aircraft leaves the constructors' hands it can be flown, but is still not fully equipped for operational purposes. Guns and radio have still to be fitted, and this is done at the "M.U.")

Early this year the work of A.T.A. was extended. They were given their own uniform (an adaptation of the British Airways uniform) and their own stations, not under direct R.A.F. control, and these were staffed with Airways personnel. There are four of these ferry pools situated in various parts of the country. In all probability more will be needed. At present a fleet of nearly 50 "taxis" (such as Ansons and Couriers) is used to take the ferry pilots to their assignations. The daily schedules of the ferry officer are more complicated than those of any civil airline in peacetime. Some of these "taxis" will carry as many as six or eight pilots at one time, sitting on the floor, and reading or playing cards to pass the time.

The number of pilots at present employed by A.T.A. is 133. Another hundred could be utilised almost immediately. Of the present total, 20 are women, though some of these are still being trained.

As A.T.A. pilots may be called upon to fly any of nearly forty types, and several very different kinds in one day sometimes, the training is rigorous. The Central Flying School provides conversion courses. The British Overseas Airways School has now been pressed into service for refresher courses. Other training in "dual-control" machines is given at the ferry pools themselves.

The life of a ferry pilot is no picnic. He may be asked to fly 600 miles in a day and be back at his pool by early evening, ready for another job next morning.

Those who have the necessary experience and would like to join A.T.A.—the pay for men is about £8 a week—should write to Airways House, S.W.1.

An idea which works. Capt. McKinley devised a pair of rubber floats for his light plane, and has demonstrated that they perform well both on water and on ice. The scheme might be applied to deflatable outboard floats for flying boats.

New Director-General

LORD BEAVERBROOK, Minister for Aircraft Production, has appointed Mr. W. L. Stephenson Director-General of Equipment. Mr. Stephenson is chairman of the great Woolworth concern, but it is not thought that he intends to transfer to the M.A.P. the motto "nothing over 6d."

A Glasgow Appointment

WE learn that Mr. Norman G. Widger has been appointed publicity manager to G. and J. Weir, Ltd., of Cathcart, Glasgow. It may be recollected that Mr. N. Biles relinquished that post some time ago to take up a similar one with Blackburn Aircraft.

Increasing Engine Production

A LARGE loan to the Wright Aeronautical Corporation has been authorised by the Reconstruction Finance Corporation in Washington for the purpose of expanding its facilities for aircraft engine manufacture. The loan totals £23,000,000 and the rate of production is expected to be increased up to 12,000 engines per year.

First Canadian Fighter Squadron

THE first Canadian Air Force Fighter Squadron has landed in this country. They have arrived complete with their Canadian-built Hurricanes, motor transport, spare engines and airframes sufficient to last them for some while. Eighty-three of the ground staff have been trained under the Empire Training Scheme.

Their squadron leader has more than 2,000 hours flying to his credit, and ten of the pilots are from the original No. 1 Fighter Squadron of the Royal Canadian Air Force. The remaining pilots are auxiliaries from Montreal. They were fully trained on Hurricanes before they left Canada, and after a short refresher course, when doubtless the latest air-fighting tactics will be explained to them, they will be ready to go into action.

Donations for Aircraft

MORE donations continue to come in from widely different sources towards the cost of providing aeroplanes for the Fighting Forces. The Royal Calcutta Turf Club has given £88,000 to the East India Fund for the purchase of Spitfires, and £10,000 has been raised by residents of Worcester in three weeks. In recognition of this gift two Spitfires will be named *City of Worcester* and will carry the city's coat of arms.

Mr. Gordon Armstrong, of Longcroft Hall, Beverley, has given £8,500 and an appeal is being made among the retail newsagents with the object of paying for a squadron of Spitfires. So far, most of the money has been donated for fighter aircraft, with the Spitfire leading from the Hurricane in public preference.

The total donated up to the present for all types is the large sum of £2,048,521, which will buy, in round numbers, about 350 fighters.

HERE and THERE

A 39,000ft. Delay

A RUSSIAN parachutist, Kharakhonoff, is reported to have jumped from an aeroplane at 12,450 metres (41,000ft.) and to have fallen 11,800 metres (39,000ft.) before opening his parachute. This seems to be a considerable height to reach for an aeroplane carrying a pilot and parachutist.

Dominion News

WITH the advent of conscription, volunteering ceased in New Zealand on July 22 after a total of 59,664 men had enrolled for the Army. (This does not include Navy and Air Force figures.) Recruiting is now by ballot, except for the Air Force.

It was recently announced in Sydney that 125,000 men had volunteered for the Royal Australian Air Force. Seven more stations for the British Commonwealth Air Training Plan will be opened within the next few weeks.

The Times for July 29 carries a report headed "Air Ambulances for Australia," which states that the Royal Automobile Club has collected £A25,000 for the purchase of air ambulances, that it had provided 60 ambulances and promised 60 more. The term "air ambulance" is usually used in the meaning of an aeroplane doing ambulance work, but in this case what the Royal Victorian Automobile Club is undoubtedly doing is to provide automobile ambulances for co-operation with the Air Force.

Mauritian Generosity. Sir Bede Clifford, Governor of Mauritius, hands to Mr. A. V. Alexander, First Lord of the Admiralty, two cheques and a silver cigarette box. The latter was for the wardroom of H.M.S. *Mauritius*, and one of the cheques (£11,000) for the purchase of a seaplane for that ship. The other cheque (£150,000) was for the prosecution of the war.

HERE AND THERE (CONTINUED)

45,000 New Pilots for U.S.A.

THE C.A.A. Civil Pilot Training Programme will be expanded to provide primary training for 45,000 new pilots by July, 1941. It was announced in mid-June that the programme would have turned out 9,810 pilots by the end of that month, and that 15,000 additional pilots would be trained by September. Teaching facilities are available at 550 centres in U.S.A. and its territories. Only one student has been killed while flying.

A Splendid Example

IN a broadcast speech last week Lord Beaverbrook disclosed the fact that employees of A. V. Roe and Co., Ltd., of Manchester, had undertaken to make a gift of one of our latest fighters to the Ministry of Aircraft Production. Lord Beaverbrook paid a handsome tribute to the Avro workers through Mr. R. H. Dobson for their generous example. No mention was made of the type of fighter, but the word *latest* is significant, and, as Avro's make bombers and reconnaissance aircraft, it may be assumed that the fighter will be bought from another firm in the Armstrong-Siddeley group.

A Redoubtable Family

FLYING - OFFICER RHODES-MOORHOUSE, who has been awarded the D.F.C. for bringing down five enemy machines, is the son of Second-Lieutenant W. B. Rhodes-Moorhouse, of No. 2 Squadron, who was the first air V.C. The Victoria Cross was awarded for bravery shown in coming down as low as 300 feet to bomb a target against considerable rifle and machine-gun fire from the ground defences. Despite the fact that 2nd/Lt. Rhodes-Moorhouse was wounded in the abdomen by a bullet and yet again in the thigh and in the hand on the way back, he flew his aeroplane back to his own base at Merville although there were other and nearer aerodromes at which he might have put down. He died of wounds the next day.

He was one of the pioneers of flying in this country, having qualified for his pilot's certificate in 1911.

F/O. Rhodes-Moorhouse was commissioned as a pilot officer in the Auxiliary Air Force in 1937 and was for some time a director of Percival Aircraft, Ltd.

Grumman Into Production

AN order for 80 Grumman fighters has been placed with that factory and production is now well under way with the testing and crating for shipment of the first one at Roosevelt Field, Long Island, on July 28.

From its description it is apparently the Grumman G-36 single-seater fighter, a single-engine midwing monoplane with the wheels retracting into the fuselage. Of all-metal construction, it has the stumpy appearance characteristic of all Grummans. The engine is either a Pratt and Whitney Twin Wasp or a Wright Cyclone, each having about 1,200 h.p. available for take-off, with altitude ratings of 900 h.p. at 17,400ft. or 1,000 h.p. at 13,500ft. respectively. Maximum speeds are 330 m.p.h. at 19,500ft. or 325 at 15,500, also respectively. At sea level the maximum speed is 290 m.p.h. Tankage is given as 160 U.S. gallons (133 Imperial gallons). Consumption on 75 per cent. power would be about 50 g.p.h., so that the corresponding duration would be 2.7 hours. Armament is believed to be six machine guns.

"Flight" photograph.

F/O. W. H. Rhodes-Moorhouse

H.R.H. the Princess Royal, accompanied by Air Marshal E. L. Gossage, inspecting two Airspeed Oxford air ambulances, which were bought with Girl Guide donations.

READY FOR ANYTHING : H.M. the King inspecting aircraft crews of the Bomber Command during a recent visit to one of the bomber stations. It will be noted that the crews are wearing the new Irvin Harnisuit which incorporates the usual parachute harness and also the flotation jacket The suit has quick-release hooks for releasing the parachute on reaching the water and the flotation jacket is supplied by a small bottle of compressed CO_2 for inflation. Should this fail a mouthpiece is also provided.

Expanding American Production

LORD BEAVERBROOK, Minister of Aircraft Production, announced in a broadcast that the United States will set about expanding its industry up to such an extent that it will be able to supply aircraft at the rate of 3,000 per month. He said that plans to this end will be developed without delay and that the production rate mentioned was in addition to the orders already placed by the Allied Purchasing Commission. Such a rate is a tremendous one and is a staggering increase on present production which, if confined to aircraft of military value, is probably not more than 500 per month. Though it will take some time to achieve this rate, the decision is news we are very glad to hear. Editorial comment is made on the announcement on The Outlook page.

Mr. Morgenthau, U.S. Secretary of the Treasury, says he has no doubt that Britain will be able to pay for the huge number of aircraft under the expanded scheme. We have no doubt that Britain *will* pay, for it has been agreed under the financial arrangements that the cost of the new factories to be erected will be met by Great Britain.

A formation of Fiat B.R.20s. They cruise at about 210 m.p.h.

A STANDARD ITALIAN BOMBER

Designed for Bombing and Reconnaissance, the B.R.20 is an All-Fiat Product

IN most of the aircraft-manufacturing countries there are one or more firms which produce both aircraft and engines. Sometimes, although not inevitably, such a firm's aeroplanes are powered by the firm's own engines, and the combination should, theoretically, be the best possible because it is to be supposed that the very closest co-operation between the aircraft and engine departments has been applied. It will, of course, happen now and again that such a firm designs an aircraft type for which the firm's own engines are not suitable, but, generally speaking, the production of the entire aircraft under one control should give an harmonious design.

An Italian example of the unified product is the B.R.20 bomber, illustrated herewith. A product of the Fiat company, of Turin, this machine can be regarded as being approximately in the same class as our Wellington,

FIAT B.R.20

Two Fiat A.80 R.C.41 Engines

DIMENSIONS.

Length o.a.	52ft. 9in.
Wing span	70ft. 9in.
Height	14ft. 1in.
Wing area	800 sq. ft.

WEIGHTS AND LOADINGS.

Weight empty	14,500 lb.
Disposable load...	7,900 lb.
Gross weight	22,400 lb.
Wing loading	28 lb./sq. ft.
Power loading	11.2 lb./h.p.

PERFORMANCE.

Speed at ground level	217 m.p.h.
Speed at 6,560ft.	235 m.p.h.
Speed at 13,000ft.	264 m.p.h.
Speed at 16,400ft.	261 m.p.h.
Speed at 19,700ft.	255 m.p.h.
Cruising speed	210 m.p.h.
Service ceiling	26,000ft.
Service ceiling after bomb release	32,800ft.
Range at cruising speed and 13,000ft.	1,240 miles
Climb to 19,700ft. in 23 mins.	

The new nose. This should be compared with the photograph of the original nose on the opposite page. The bomb-aimer's view is obviously very much better.

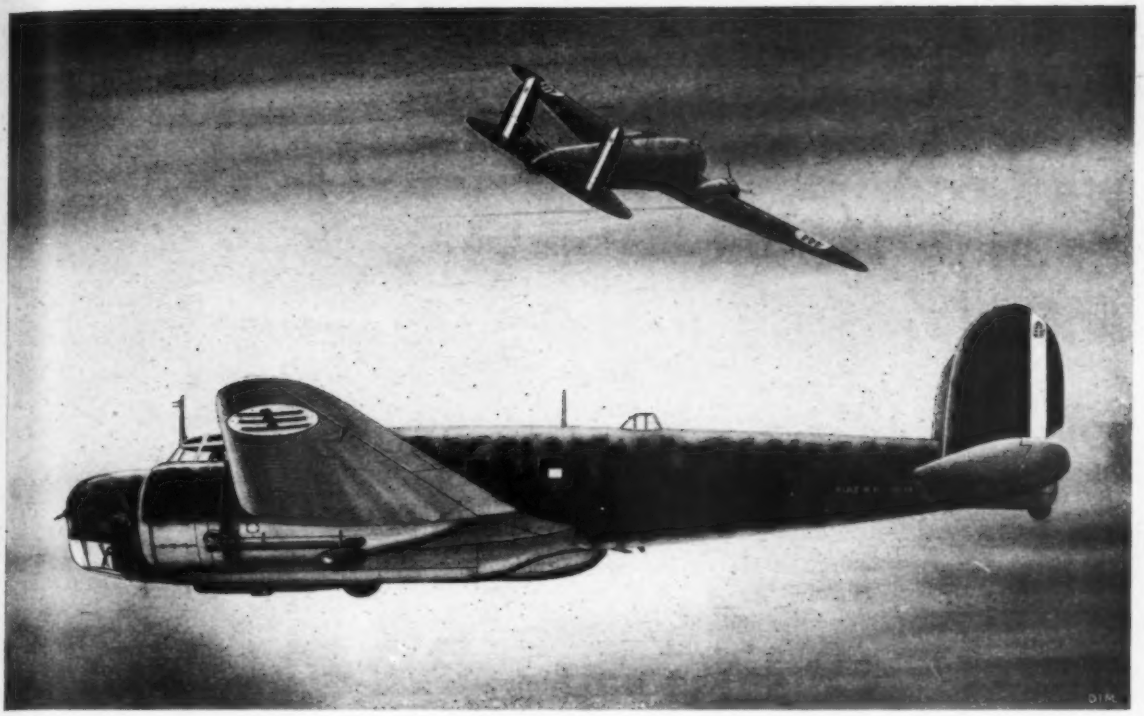
using the expression with reference to gross weight and power, and not as applied to quality. The Fiat company, in common with most large firms, has several designers, some specialising on one class of aircraft, some on another. In the case of the B.R.20 the letter R is the initial of the designer, Rosatelli, and "B" indicates bomber.

The B.R.20 differs from several Italian bombers in that it has been designed to what may be termed the orthodox formula. It is a twin-engined monoplane of generally clean design, and with twin fins and rudders. Other Italian designers have shown a decided preference for the three-engined formula. In this country—as, indeed, in most others—it is held that the engine in the nose of the fuselage does not "pull its weight," apart from the fact that it occupies a space in the fuselage which is wanted for the bomb-aimer.

Modifications

Certain changes in the design of the nose of the B.R.20 have been made since the machine first appeared. These are obvious from an examination of the pictures on this and the next page. The amount of framing evidently interfered with the bomb-aimer's view, and now the lower portion of the nose is practically all transparent.

Reference has been made to the "orthodoxy" of the aerodynamic design of the B.R.20. The structural features are equally straightforward, although a certain amount of composite construction is incorporated, so



Two aspects of the Fiat B.R.20 are seen in this *Flight* copyright drawing. The bombs are stowed in the parallel portion of the fuselage floor. Just aft of the bomb bay is the lower gun position.

that the machine is not entirely of stressed-skin type. The fuselage, for example, has a framework of welded chrome-molybdenum steel tube in the tail portion, which is covered with doped fabric. The front portion is a stressed-skin monocoque.

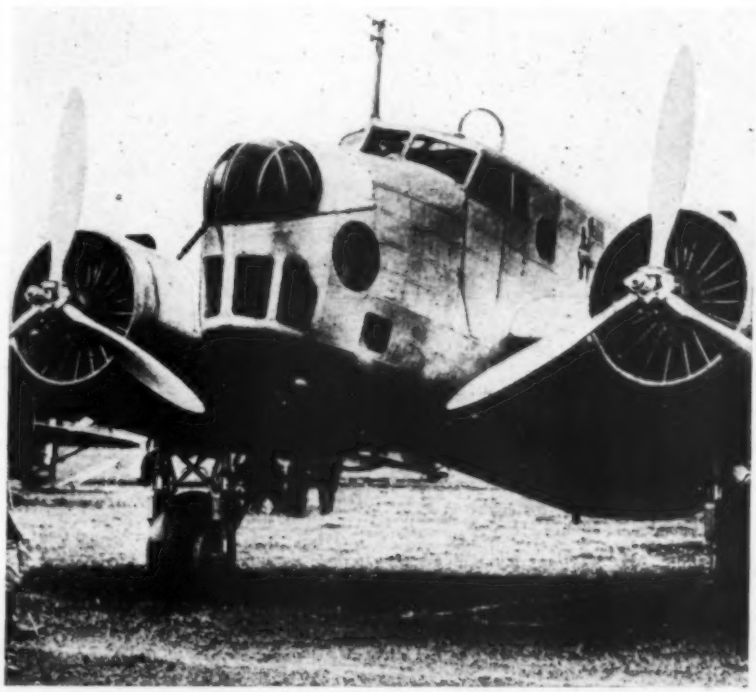
In the structure of the wing also a mixed form of construction is employed. There are two main spars, and the leading edge is metal covered while the trailing edge portion has a fabric covering over tubular ribs. The wing is built in three sections, the two outer tapering portions being attached to the centre section just outside the engine nacelles. Trailing-edge flaps are fitted.

The retractable wheels of the undercarriage are raised backwards into the tail portion of the somewhat long engine nacelle fairings. The wheels are carried on high-tensile steel forks with oleo shock absorbers.

Power Plant

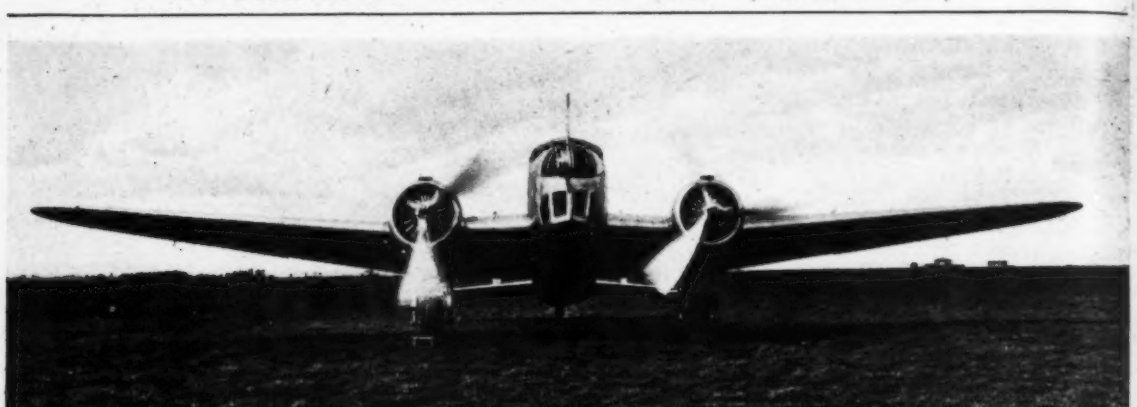
Power is supplied by two Fiat A.80 R.C.41 18-cyl. double-row radial engines. Two versions of the A.80 engine are available, the R.C.20 which develops 1,200 b.h.p. for take-off and 1,100 b.h.p. at 2,000 m. (4,400ft.), and the R.C.41, which gives 1,000 b.h.p. for take-off and develops 1,000 b.h.p. at 4,100 m. (13,500ft.). The standard version of the B.R.20 is fitted with the latter type. Hamilton Standard constant-speed airscrews built under licence by the Fiat company are fitted.

The following data relating to the Fiat A.80 R.C.41 engine may be of interest. The bore is 140 mm. and the stroke 165 mm., giving a capacity of 45.72 litres. The engine has a length of 1.62 metres and a diameter of 1.335 metres. The weight is 725 kg. (1,600 lb.). The power for take-off at 1,995 r.p.m. is 1,000 b.h.p., and at 2,200 r.p.m. it is 1,030 b.h.p. The normal engine speed at the operational altitude is 2,100 r.p.m. Reduction gearing gives a corresponding airscrew



Demoded: The original nose of the B.R.20 had a good deal of window framing obscuring the bomb-aimer's view.

A STANDARD ITALIAN BOMBER (CONTINUED)



The fairly clean design of the B.R.20 can be judged from this front view, which shows the original nose, now changed for one of better shape. The dihedral angle of the outer wing portions is to be noted.

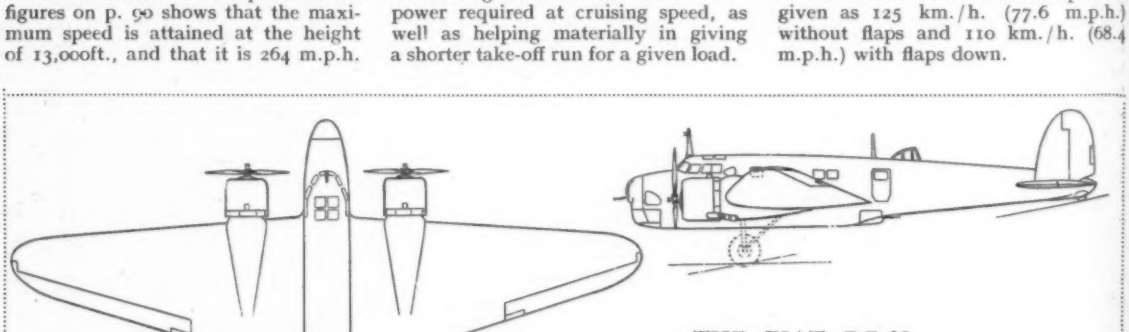
speed of 1,312 r.p.m. The engine, by the way, is designed to run on 87 octane fuel.

The B R.20 carries a maximum bomb load of 1,600 kg. (3,500 lb.), and the defensive armament comprises a 12.7 mm. gun in a Breda power-driven turret in the nose; two guns in a retractable turret on top of the fuselage, and a fourth gun in the belly of the fuselage, aft of the wing.

An examination of the performance figures on p. 90 shows that the maximum speed is attained at the height of 13,000ft., and that it is 264 m.p.h. This is approximately what one would expect from the figures of wing loading and power loading, and is approximately the same as that of the Wellington, the nearest comparable British type. The British machine is, however, vastly superior to the Fiat in the bomb load it carries and the range. This is probably accounted for largely by the high aspect ratio of the Wellington's wing, which keeps down induced drag and thus reduces the horse-power required at cruising speed, as well as helping materially in giving a shorter take-off run for a given load.

Data supplied by the manufacturers (before the war, of course!) include one figure which is not often given. The ceiling, when the bombs have been dropped and some of the fuel consumed, is 10,000 m. (32,800ft.). The single-engined ceiling at a loaded weight of 9,500 kg. (21,000 lb.) is 13,000ft.

It does not appear that the trailing edge flaps are remarkable for their effectiveness. The minimum speed is given as 125 km./h. (77.6 m.p.h.) without flaps and 110 km./h. (68.4 m.p.h.) with flaps down.



THE FIAT B.R.20
2 Fiat A.80 R.C.41 Engines

Can You Beat It?

THE National Savings Group organised by Brown Brothers, Ltd., and their allied companies bought during National Savings Week no fewer than 3,114 National Savings Certificates, in addition to £290 worth of Savings Stamps.

Started at the beginning of the year, this group has the high average monthly sales total of 2,061 National Savings Certificates and £530 in Savings Stamps.

General Aircraft Annual Meeting

THE chairman, Sir Maurice Bonham Carter, K.C.B., K.C.V.O., was able to announce a dividend of 5 per cent. for the year at the annual general meeting of General Aircraft, Ltd. The profit amounted to £105,368 for the period under review, and £23,152 has been carried forward.

In the course of his speech Sir Maurice was able to tell the shareholders how, despite the dreadfully disturbed condition of the world, they found it possible to construct and export "Cygnet" aircraft. Full support from all the Government departments concerned had been received to this end.

SERVICE AVIATION

Royal Air Force Official Announcements

Personal Air Secretary Appointment

THE RIGHT HONOURABLE SIR ARCHIBALD SINCLAIR, BART., C.M.G., M.P., Secretary of State for Air, has appointed Wing Cdr. Sir Louis Greig, K.B.E., C.V.O., to be his personal air secretary.

King and Queen Visit Coastal Command

ON Monday of last week the King and Queen visited a Coastal Command station. They were received by Air Chief Marshal Sir Frederick Bowhill, and met many of the officers and men. Their Majesties were particularly interested in the photographic section, where they spent a long time looking at photographs of damage done by the R.A.F. bombers on objectives in Germany and occupied countries.

Four officers received their decorations from the King's hand. Wing Cdr. G. W. Tuttle, who conducted the party round the station, received the O.B.E. for outstanding staff work, Act. Flt. Lt. E. C. Le Mesurier the D.F.C. for some long reconnaissance flights of great value, F/O. D. F. R. Sheen the D.F.C. for leading his section of three aircraft against a superior number of enemy machines. He forced one down into the sea and damaged another. P/O. J. A. M. Reid got his D.F.M., which he had won as a sergeant pilot when acting as second pilot and navigator of an aircraft which obtained valuable photographs under adverse weather conditions.

Administrative Officers for the R.A.F.

IN view of the magnificent response to the recent appeal for administrative officers for the R.A.F. no further applications are required at present. Each application is considered individually, and for that reason and because of the large numbers to be dealt with there may be some delay before every applicant receives a reply. Candidates should refrain from enquiring about the progress of their applications, as they will be informed as soon as possible. There are many vacancies to be filled immediately. When they are filled a pool of potential officers will be formed to fill future vacancies as they occur. Candidates who are not offered immediate appointments, therefore, may be asked whether they are willing to be listed for service later if required.

Wireless Operators

RECRUITS are needed by the Royal Air Force to be trained as wireless operators. The pay will be 2s. a day on enlistment, increasing to 3s. 6d. a day when qualified. In addition, all trainees will be given an opportunity to volunteer for additional training as air-gunners and qualifying for an air crew. In this case, upon qualification as a wireless operator/air gunner, the pay will be 7s. 9d. a day, with the rank of sergeant. The pay in all cases will be with all found.

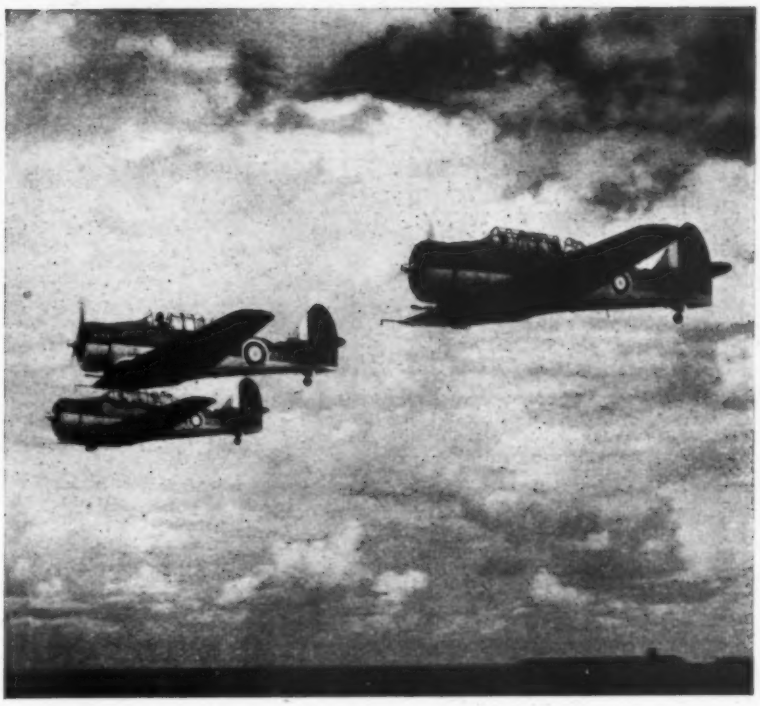
The qualifications for enlistment as wireless operators under training are: age between 18 and 38; medical category 1, 2s, 2 or 3; a good standard of education and quick intelligence.

Wireless Mechanics

RAPID expansion of the Royal Air Force has resulted in an increased demand for men able to maintain radio appliances. This job is one of vital importance and fully qualified mechanics with a good theoretical and sound practical knowledge of radio are urgently required. No experience of Morse code is necessary. The appeal for volunteers is addressed to men between the ages of 18 and 50 on the servicing side of the radio industry but those already employed on radio-instrument production or other work directly connected with the war effort are not eligible.

Wireless engineers, testers, repairers, radio service men and wireless mechanics who are not affected by the proviso are asked to offer their services immediately. Pay on entry varies from 3s. 9d. to 5s. 6d. per day, according to proficiency, and, in addition, food, clothing and accommodation are provided by the Service, with good prospects of promotion. Men registered under the National Service (Armed Forces) Acts, who have not yet been posted for service with one of the Forces, may volunteer.

Application should be made to the nearest combined recruiting centre, the address of which may be obtained from any Employment Exchange.



ADVANCED TRAINING: Pupils from an R.A.F. flying training squadron practising formation flying on North American Harvards.

Cadet Commissions

HIS MAJESTY THE KING has graciously approved the grant by the Air Council of cadet commissions to officers of the Air Defence Cadet Corps. Cadet commissions will not extend beyond the rank of Cadet Wing Commander, and their issue will be restricted to officers of those cadet units which are affiliated to units of the Royal Air Force, or of the Auxiliary Air Force. It is contemplated that subsequent promotion to any rank higher than that granted in the commission issued by the Air Council should be effected by the Air League itself. Cadet officers will enjoy the style and title of their cadet rank with the prefix "Cadet." Gentlemen holding cadet commissions will not be armed with any powers of command enforceable by air force law.

German Air Trophies

TROPHIES taken from the German Luftwaffe are on view for the first time at the W.A.A.F. Exhibition and Recruiting Bureau at Selfridge's, London. Among the exhibits is a collapsible rubber boat of the sort which has frequently been mentioned in official announcements of German aircraft shot down off the coasts of Britain. British and German parachutes, and a Nazi pilot's heated flying suit are also on show.

Photographs depict the life of an airwoman on a R.A.F. Station, and show something of the different trades of the W.A.A.F. in which they are employed. The jobs for which recruits are most urgently needed at the moment are those of plotters, radio-operators, cooks, mess and kitchen staff, fabric workers and teleprinter operators.

R.A.F. Benevolent Fund

A DONATION of £1,100 "in recognition of the magnificent work of the Royal Air Force" has been sent from Rangoon to the Royal Air Force Benevolent Fund. It comes from Lady Booth-Gravely and Mrs. Luin Ure, O.B.E., joint honorary organisers of the 1940 Carnival in Rangoon, and is only one of the many donations from overseas recently received by the Fund. These include £320 from the British Women's Patriotic Committee in the Argentine Republic; £85 from the Cultura Inglesa Guild, Calle Florida, Argentina; £300 from the British War Charities Fund, Lourenco-Marques, Portuguese East Africa; £50 from the Witbank and District War Fund, Transvaal, South Africa; and £46 from the Fildbust Branch of the Women's National Service League of Southern Rhodesia. Among other recent contributions are £350 from the Flying Services Fund by courtesy of the committee of the Royal Aero Club, £100 from the Anglo-American Oil Company and £100 from the executors of the late Major B. H. Archer.

As will be readily realised, the Royal Air Force Benevolent Fund has many urgent calls upon its resources at the present time, and further donations, both great and small, will be very thankfully received. Admiration and gratitude for the splendid services which are daily being rendered to the nation by the officers and men of all ranks of the Air Force can be fittingly shown by offerings to the Fund. They can be sent to the Royal Air Force Benevolent Fund, Eaton House, 14, Eaton Road, Hove, Sussex. The Patron of the Fund is H.M. the King and its President H.R.H. the Duke of Gloucester, K.G.

Air Awards

THE KING has been graciously pleased to approve the following appointments and awards:—

APPOINTED A COMPANION OF THE DISTINGUISHED SERVICE ORDER.

Sqn. Ldr. J. K. M. Drysdale, Flt. Lt. D. C. Yorke.

AWARDED THE DISTINGUISHED FLYING CROSS.

Sqn. Ldr. C. G. Hill, Sqn. Ldr. W. B. Murray, Flt. Lt. A. C. Brown, Flt. Lt. E. G. Campbell-Voullaire, Flt. Lt. N. B Hallmark, Act. Flt. Lt. W. S. Barton, Act. Flt. Lt. W. D. Blackwood, Act. Flt. Lt. P. W. A. Dudgeon, Act. Flt. Lt. G. R. Shepley (since reported killed in action), F/O. J. W. W. Hurndall, F/O. R. J. S. Rust, P/O. B. Clegg, P/O. P. G. Dexter, P/O. M. P. C. Holmes, P/O. A. Hughes, P/O. W. C. Hutchings, P/O. R. E. Langley, P/O. G. L. Sinclair, P/O. P. D Smith, P/O. J. R. Whelan.

The above awards are for gallantry and devotion to duty in the execution of air operations.

Pilot Officer Charles Peter Dovey Price. During a night in July, 1940, this officer was pilot of an aircraft engaged in a bombing raid on an aircraft factory at Bremen. In spite of extremely difficult conditions, he successfully located his target and carried out a determined attack, at an altitude of 500 feet, in the face of anti-aircraft fire. On the return journey P/O. Price engaged three Messerschmitt 110s which he had observed flying above the aerodrome at Borkum. By skilful manœuvring he enabled his rear gunner to fire bursts at one of the enemy aircraft, which appeared to be hit, and then engaged a second fighter which was shot down into the sea with its

SERVICE AVIATION (CONTINUED)

port engine on fire. P/O. Price displayed great courage, initiative and determination throughout the operation.

P/O. J. F. Drummond. During operations in Norway this officer shot down two enemy aircraft and seriously damaged a further three. On one occasion, as pilot of one of two Hurricanes which attacked four Heinkel 111s, he damaged one of the enemy aircraft and then engaged two of the others. Despite heavy return fire, P/O. Drummond pressed home his attack, silenced the rear guns of both aircraft, and compelled the Heinkels to break off the engagement.

Act. Flt. Lt. J. H. Coghlan. This officer has been a flight commander in his squadron on most of the recent patrols, and has led the squadron on some occasions. At all times he has shown the greatest initiative and courage, and has personally destroyed at least six enemy aircraft.

F/O. A. D. Forster, Auxiliary Air Force. This officer has displayed great courage and devotion to duty in participating in all patrols recently undertaken by his squadron, during which he has destroyed at least two enemy aircraft. Previously he has been engaged in intensive flying operations in France, where he destroyed four enemy aircraft.

F/O. W. H. Rhodes-Moorhouse, Auxiliary Air Force. This officer has been engaged on operational flying since November, 1939. During this period he has destroyed five enemy aircraft, and has displayed great courage and devotion to duty.

P/O. J. R. Hamar, since deceased. This officer has participated in all operational and most of the patrol flights undertaken by his squadron. He has shown coolness and courage of a high order, and has personally destroyed six enemy aircraft.

P/O. D. A. A Romans. P/O. Romans was navigator and bomb aimer in an aircraft engaged in a recent bombing attack on Eschwege aerodrome. During the attack, the aircraft was hit by a shell from the ground defences, and the pilot was rendered unconscious. P/O. Romans, realising that the aircraft was flying in an erratic manner, and receiving no communication from the pilot, proceeded to the pilot's cockpit, and, sitting on the unconscious pilot's knees, gained control of the aircraft. He continued to fly it under these conditions until the injured pilot was removed some twenty minutes later by the remainder of the crew. This officer performed a fine feat of airmanship, and showed great presence of mind in gaining control of the aircraft under such difficult conditions, especially as it was flying at a dangerously low altitude and subjected to intense and accurate anti-aircraft fire. He further succeeded in flying the aircraft safely back to its base, which necessitated accurate navigation, without assistance.

P/O. J. B. Weightman. During a night in June, while captain of a Hudson aircraft on reconnaissance along the Norwegian coast, he successfully attacked an enemy submarine and completed a most valuable reconnaissance. Later he was attacked by two Me. 110's, one of which was badly damaged by his air-gunner. During the war he has been on 92 operational flights over the sea and has taken part in six successful bombing raids.

DISTINGUISHED FLYING MEDAL.

Sgt. B. J. Brooks, Sgt. G. H. Cooper, Sgt. R. A. Latham, Sgt. J. H. Strong, Sgt. W. P. Whetton, Sgt. L. S. Wyse, Cpl. A. Daley, Cpl. H. R. Jones, Cpl. G. P. Watts, L.A/C. G. J. Allen, L.A/C. J. Brown, L.A/C. J. Clark, L.A/C. D. A. Drewitt, L.A/C. G. R. Stephenson.

Flt. Sgt. F. W. Higginson. This airman pilot has led a section during all operations undertaken by his squadron, and has personally destroyed at least five enemy aircraft. He has shown the greatest determination in the face of the enemy, and his cool and courageous leadership has been an example to his squadron.

The above awards are for gallantry and devotion to duty in the execution of air operations.

Roll of Honour

Air Ministry Casualty Communiqué No. 40.

THE Air Ministry regrets to announce the following casualties on various dates. The next of kin have been informed.

KILLED IN ACTION (WHILE FLYING IN OPERATIONS AGAINST THE ENEMY).—A.Flt. Lt. Barran, 90323; L.A/C. J. S. M. Bromley, 521432; Sgt. R. C. Christie, 550636; P/O. H. A. Clark, 72590; Sgt. F. Clayton, 643566; Sgt. I. C. C. Clenshaw, 745067; Sgt. J. H. Fletcher, 935134; F/O. M. F. H. Fox, 39870; L.A/C. J. H. Gillham, 533930; Sgt. J. S. Jeffrey, 581226; F/O. J. C. Kennedy, 40052; P/O. J. Kershaw, 72503; Sgt. M. Kline, 522740; Sgt. J. W. Liddle, 638666; Sgt. A. D. W. Main, 748115; F/O. E. W. Mitchell, 37820; Sgt. D. D. Morton, 581230; Sgt. H. F. A. Nicholas, 563273; P/O. J. Rex, 78982.

PREVIOUSLY REPORTED "MISSING, BELIEVED KILLED," NOW PRESUMED "KILLED IN ACTION."—L.A/C. R. T. Carr, 534563; F/O. J. A. H. Cooper, 39065; A/C.1 F. G. Hooker, 547172; A.Sgt. G. E. F. Martin, 580786; F/O. J. P. Trewby, 39622; Cpl. H. D. Whitehouse, 528158.

PREVIOUSLY REPORTED "MISSING." NOW PRESUMED "KILLED IN ACTION."—Sgt. W. Anderson, 580390; L.A/C. A. M. Dickie, 566708; Flt. Sgt. A. K. Fearnside, 563436; P/O. K. Laxton, 70389; L.A/C. T. V. Lewis, 531954; P/O. E. F. Lines, 36224; A/C.1 E. M. G. Polhill, 551731; A/C.2 C. Walker, 627354.

PREVIOUSLY REPORTED "MISSING, BELIEVED KILLED," NOW REPORTED "KILLED IN ACTION."—Sgt. D. L. Anthony, 561995; A.Flt. Lt. B. R. Kerridge, 39199; P/O. A. V. N. Bartlett, 78669; L.A/C. W. D. Boyle, 618097; A/C.1 T. J. Bryan, 531862; Sgt. H. R. Hall, 564340; P/O. W. N. Hammond, 43136; Sgt. A. Livingston, 562187; P/O. D. G. Macqueen, 42142; Sqn. Ldr. G. E. Peacock, D.F.C., 33067; Sgt. A. A. Townsend, 580215; L.A/C. P. R. Whittle, 611596.

WOUNDED OR INJURED IN ACTION.—Sqn. Ldr. J. H. Hill, 32172; P/O. W. Hughes, 41182; P/O. D. N. Janes, 41793; Sgt. E. W. Lloyd, 581069; F/O. H. M. Robertson, 39568; P/O. G. T. Southgate, 40953; F/O. D. M. Taylor, 40155; P/O. S. R. Thomas, 42029; P/O. M. W. Waddington, 33401; P/O. R. M. Walker, 40166; Sgt. C. W. West, 743073; Sgt. A. W. Woolley, 740788.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Sgt. L. Howard, 552504; P/O. M. R. Mudie, 42073.

PREVIOUSLY REPORTED "MISSING," NOW REPORTED "WOUNDED OR INJURED IN ACTION."—A/C.2 E. Hannah, 970492; Sgt. P. G. Ottewill, 565387.

PREVIOUSLY REPORTED "WOUNDED OR INJURED ON ACTIVE SERVICE," NOW REPORTED "WOUNDED OR INJURED IN ACTION."—F/O. H. D. Clark, 33382.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. J. B. M. Brown, 741269; Sgt. C. F. Burt, 539698; Sgt. F. J. P. Dixon, 742124; Sgt. J. B. Dorrington, 900499; Sgt. G. E. Duck, 551700; Sgt. T. W. Hartley, 581153; P/O. D. A. Lea, 41432; P/O. W. D. Mackley, 42415; Flt. Lt. J. D. W. Murray, 39559; Sgt. W. L. Rawson, 580595; Sgt. C. D. Stevens, 581538.

MISSING.—A/C.1 A. A. Adams, 747551; Sgt. A. Aitken, 513170; F/O. J. H. L. Allen, 39957; Sgt. G. A. Allison, 552647; A/C.2 E. C. S. Applin, 906916; Cpl. A. Ashley, 350089; P/O. H. L. Atkin-Berry, 41360; Sgt. S. L. Bain, 742188; Sgt. L. G. Baker, 581492; P/O. R. A. A. Ball, 42585; A/C.1 J. E. C. Bardgett, 542802; A/C.1 J. B. Belderson, 570289; Wing Cdr. L. C. Bennett, 16216; Cpl. R. R. Bodden, 525364; L.A/C. R. Broadbent, 615898; A/C.2 A. Brown, 552771; P/O. R. M. Buchanan, 42556; Sgt. A. St. J. Bunker, 745279; Sgt. C. J. Burt, 629920; P/O. A. D. Carter, 40887; L.A/C. J. Caton, 2730; A/C.2 T. H. Childs, 906929; A/C.1 P. Clark, 623619; A/C.1 D. B. Clarke, 640028; Cpl. H. Clarke, 652931; A/C.2 H. K. Clayton, 939118; Sgt. R. D. Cook, 580997; A/C.1 J. W. Cooper, 633627; Sgt. J. W. Craig, 743022; L.A/C. R. A. R. Cross, 900352; Sgt. T. F. Denton, 509566; L.A/C. H. D. Derwin, 509271; A/C.2 G. A. Dignan, 619976; Sgt. G. T. Drew, 580431; A/C.1 G. R. Dunthorne, 618587; Cpl. W. G. Eldred, 354733; Sgt. N. Emmerson, 642716; P/O. L. J. E. Ewing, 41274; Sgt. J. Falconer, 551873; L.A/C. H. Fisher, 551310; A/C.1 J. E. Fothergill, 212009; Sgt. J. V. Futcher, 641321; A/C.2 C. Garside, 978500; Sgt. B. R. George, 967684; L.A/C. W. Gleave, 623079; Sgt. A. Glen, 629156; Cpl. C. A. Golding, 509633; Sgt. G. H. Goldsmith, 526218; A/C.2 W. J. Greenman, 977406; Cpl. R. G. B. Grove, 505901; A/C.1 H. C. Gunn, 617121; L.A/C. R. H. F. Hammond, 536608; Cpl. T. B. M. Harding, 550526; A/C.1 W. Harpham, 623494; Sgt. P. R. Harris, 581152; P/O. D. M. Harry, 40823; Sgt. J. F. Hatch, 903079; Sgt. G. C. G. Hawkins, 746982; P/O. S. R. Henderson, D.F.C., 40826; A/C.2 A. Hill, 908668; L.A/C. J. F. Hindle, 546994; Sgt. S. E. Hinton, 755307; A/C.2 A. H. J. Hodgetts, 908944; Cpl. A. F. G. Hoe, 612270; Sgt. D. B. Hopes, 741881; P/O. R. A. Hopkinson, 70324; P/O. C. W. Howie, 77937; A/C.1 W. C. Hubbard, 625793; A/C.1 O. Humphreys, 639529; Cpl. L. A. I'Anson, 618392; Sgt. R. G. Ireland, 529709; Sgt. L. Isherwood, 550470; L.A/C. M. J. E. Jarvis, 530166; Sgt. T. T. Jervis, 551360; L.A/C. D. W. Jones, 533484; Sgt. L. Jowitt, 562160; A/C.2 A. E. Laing, 625929; L.A/C. J. H. Lane, 517249; A/C.1 M. M. Lansdowne, 278360; F/O. P. H. Lewis, 70399; F/O. D. W. Lindsay, 39018; Sgt. R. W. Lonsdale, 755548; A/C.2 W. E. Lunnun, 977727; A/C.2 H. Lunt, 909562; Sgt. J. F. McCauley, 564908; A/C.2 W. McIntosh, 644566; P/O. T. W. Maslin, 42624; P/O. A. R. Mathias, 41603; Sgt. R. Mercer, 639880; A.Flt. Lt. J. D. Middleton, 33326; Sgt. G. A. Miles, 751326; Sgt. F. G. Mills, 740119; Sgt. J. Newberry, 626884; Sgt. S. J. Newcombe, 746922; P/O. J. P. North-Lewis, 73546; L.A/C. J. A. Odgers, 799580; A/C.2 N. W. Olsen, 940188; Cpl. A. Park, 526717; A/C.2 H. V. Pearson, 947539; A/C.1 W. Pugh, 548863; A/C.2 E. C. Reves, 642662; Sgt. H. W. Richardson, 581413; L.A/C. J. E. Robert, 251182; A/C.1 J. Rogers, 591650; P/O. J. A. Rose, 42887; Sgt. T. J. Rowles, 581474; A.Cpl. J. Roxborough, 937857; Sgt. A. Scott, 759142; P/O. J. Seeds, 33445; Sgt. D. C. Sinclair, 615825; Sgt. H. W. J. Smith, 812199; Sgt. T. T. Smith, 563390; Sgt. A. Spencer, D.F.M., 590466; L.A/C. J. R. Storrar, 619703; Sgt. C. Suggett, 644680; Sgt. A. T. Summers, 563808; L.A/C. G. C. Sumner, 568173; L.A/C. A. J. Taylor, 356773; P/O. J. S. Torgalson, 42732; A/C.1 E. Tredgett, 614428; Sgt. G. T. Truscott, 581482; A/C.1 K. M. Walker, 570036; A/C.1 W. A. Ward, 905570; Sgt. J. H. Waterfall, D.F.M., 631726; A/C.1 A. Watson, 620691; Cpl. A. J. Watts, 525119; F/O. A. W. A. Whitehead, 70731; Sgt. J. J. Whitfield, 526295; L.A/C. J. L. Williamson, 534498; Sgt. S. M. Wood, 751655; Sgt. L. E. Worthington, 745453; P/O. E. A. Wray, 42174; Sgt. F. Young, 517288.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE (WHILE ENGAGED ON NON-OPERATIONAL FLYING DUTIES OR ON THE GROUND THROUGH ENEMY ACTION).—Sgt. J. D. Bell, 522900; A/C.1 H. Fisher, 639435; A/C.2 H. J. Hedger, 908440; L.A/C. R. W. Hunter, 760014; A/C.2 T. E. Lawson, 908388; Sgt. H. Micklethwaite, 636876; Sgt. D. Murrie, 751305; A/C.1 J. D. Niall, 619958; A/C.1 P. W. Saunders, 547248; A/C.2 S. Smith, 623477; Cpl. J. Whittet, 591163; Cpl. W. Wilson, 591172.

KILLED ON ACTIVE SERVICE.—Sgt. H. B. Alexander, 741425; Sgt. R. R. G. Birch, 700677; P/O. G. W. F. Carey, D.F.C., 36169; Sgt. C. J. Dent, 755832; Sgt. V. G. Gent, 624628; Sgt. H. Hannan, 629054; Sgt. S. Ireland, 745103; Sgt. J. C. Johnston, 748063; Sgt. D. V. Malpass, 564042; Sgt. G. A. Matthews, 538451; F/O. T. Newton, 39943; Sgt. L. F. J. O'Kelly, 550918; Sgt. G. J. Parr, 741412; Sgt. J. N. Routledge, 513919; Sgt. W. D. Shier, 580983; P/O. P. E. Vartan, 41632; P/O. T. C. Watson, 79577; Sgt. P. I. Watson-Parker, 741433; Sgt. A. Williams, 646080; Sgt. J. Wilson, 748404; F/O. A. G. Worcester, 33338.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. J. D. Blackmore, 748220; Sgt. A. C. Smith, 745479.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—A/C.1 P. H. Clarke, 544329; L.A/C. R. H. W. Parker, 905524; Sgt. H. Pearce, 560875; A/C.2 A. R. Ward, 906836; A/C.2 K. C. Ward, 906775; A/C.2 H. Wilkinson, 626304.

DIED ON ACTIVE SERVICE.—Sgt. G. H. Barber, 515993; P/O. R. J. Carter, 78881; A/C.2 C. J. Chappell, 631703; A/C.2 M. Cook, 620895; A/C.2 P. J. Curry, 573507; L.A/C. V. Dale, 616618; A/C.2 G. J. Higgs, 649099; A/C.2 J. Phillips, 971609; Flt. Sgt. T. C. Roden, 349128; A/C.2 H. S. Storey, 752012; L.A/C. A. Swalwell, 978160; A/C.2 L. R. Williams, 626643.

PREVIOUSLY REPORTED "MISSING," NOW REPORTED "SAFE."—A/C.1 A. Grant, 615683; L.A/C. L. Laken, 536507; A/C.1 F. Parsons, 534295; A/C.1 J. T. Pearce, 530460; L.A/C. F. Smith, 613537; L.A/C. S. S. Southard, 568436.

PREVIOUSLY REPORTED "MISSING," NOW REPORTED "PRISONER OF WAR."—P/O. L. S. Adams, 41645; Flt. Lt. D. M. Barrett, 37078; Sgt. C. D. W. Bartlam, 740047; F/O. C. Y. Buckley, 39629; Sgt. P. A. M. Burrell, 580941; P/O. W. A. K. Carr, 78269; Sgt. H. G. Cumpstey, 542049; Wing Cdr. B. E. Embry, D.S.O., A.F.C., 09252; Sgt. D. Flynn, 520659; Sgt. T. A. Foreman, 625686; Sgt. R. C. Hargrave, 580775; Sgt. D. C. Hawkins, 581510; Sgt. H. L. Holmes, 633325; Sgt. H. G. Hill, 580654; Cpl. G. E. Lang, 523561; P/O. D. Macdonald, 42243; L.A/C. A. Napier, 614218; Sgt. C. H. Neary, 522356; Sgt. F. J. Percival, 562846; P/O. D. J. Plant, 40258; P/O. G. P. Robertson, 41618; Sgt. F. A. S. Roche, 581031; Sgt. R. R. Schofield, 550273; A/C.2 H. Spear, 632888; Sgt. A. A. Stanley, 520757; Sgt. A. C. Thompson, 581052; F/O. G. E. Walker, 39803; A/C.2 J. A. Webster, 625670; Sgt. E. F. Woods, 581254.

London Gazette

ROYAL AIR FORCE.

General Duties Branch.

The undermentioned are granted short service commissions as Pilot Officers for five years on the active list: (July 10) O. P. Davies; D. Rockel; J. Watters.

The undermentioned are granted commissions for the duration of hostilities as Pilot Officers on probation:—W.O.: (April 1) C. W. Francis. Flt.-Sgts.: (April 1) G. S. Forbes; D. Shaw; (June 14, Seniority April 25) J. S. Willis; (June 18, Seniority May 2) R. L. L. McCullough; (June 19, Seniority April 25) K. S. Smith; (June 20, Seniority April 25) L. Crooks; (June 25, Seniority May 9), K. J. Plested; (June 25) J. R. Watt; (June 26, Seniority May 30) G. L. Bayliss; (July 1, Seniority May 9) A. West. Temp. Flt. Sgts.: (June 18, Seniority May 9) J. E. Austin; (June 25, Seniority May 9) A. Leitch. Sgts.: (April 1) H. B. Gray; (June 10, Seniority May 9) A. W. P. Leslie; (June 12, Seniority April 25) W. Fletcher; (June 15, Seniority May 30) C. H. Richardson; (June 20, Seniority April 25) J. L. Fletcher; (June 22, Seniority May 9) N. E. Hore; (June 24, Seniority May 2) R. A. Collis; W. Vale; B. B. Witty; (June 25, Seniority May 2) M. H. Holder; (June 25, Seniority May 30) R. F. Murphy; (June 26, Seniority June 11) G. Davies; (June 27, Seniority April 25) H. Gandy; (June 28, Seniority May 30) F. H. Jones; (June 30, Seniority April 25) R. Hewitt; (July 4, Seniority May 9) A. G. S. Cousens. Cpl.: (June 10, Seniority May 9) R. G. Simmons.

The undermentioned Pilot Officers on probation are confirmed in their appointments: (June 2) G. R. Bennette; G. Bunce; A. R. McL. Campbell; A. J. Ogilvie; J. R. E. Procter; (June 12) A. D. Alexander; H. C. S. Armstrong; J. Atkinson; R. H. Barber; G. C. R. Barker; N. H. Bigsby; W. J. O. Coleman; J. Curchin; K. C. D. Dart; G. J. Drake; J. V. Eason; P. C. Elliott; J. C. Fleming; P. J. Gordon-Hall; D. Hastings; P. E. Henn; K. J. Hide; O. E. Lamb; A. W. McCandlish; C. A. McGaw; M. A. G. Mason; A. G. Maycock; R. F. G. Miller; C. R. Montgomery; R. H. Morton; H. W. Noble; T. F. O'Byrne; D. C. Pascall; S. E. Pattinson; N. R. Peel; R. F. Philo; J. R. Rainford; S. J. Rawlins; C. R. S. Rich; F. T. Roberts; F. A. Robshaw; D. J. Spence; L. A. Stamer; W. B. H. Statham; R. T. Stubbs; E. A. Tingey; P. C. Traill-Smith; D. P. Tuppen; W. L. Vickerstaff; L. S. B. Worrall; D. A. Young; G. V. Donald; W. D. Heaphy; H. G. Holmes;

SERVICE AVIATION (CONTINUED)

W. McC. Osborne; A. J. Pinhorn; A. H. Sanders; R. Ward; R. F. Forbes; G. McL. Hayton; D. A. A. Ross; D. H. F. Horner; (June 26) A. C. Sargent.

The undermentioned Flying Officers are promoted to the rank of Flight Lieutenant: (April 28) R. D. B. Macfadden, D.F.C.; (May 19, Seniority May 19, 1939) J. A. C. Fuller (Lt., R. Scots); (June 16) M. J. Loudon; (June 19) L. D. Wilson; R. S. J. Edwards; (June 25) P. R. Beare. D.F.C.; J. A. Thomson; (July 6) E. G. Palmer; P. R. Patrick; (July 12) A. C. R. Thompson.

The undermentioned Pilot Officers are promoted to the rank of Flying Officer: (April 27) J. D. Smith; (June 3) P. D. Tunstall; (June 17) E. A. Johnston; I. N. M. Macdonald; (June 29), J. E. Hibbert.

The undermentioned Acting Pilot Officers on probation are graded as Pilot Officers on probation: (June 8) P. V. K. Tripe; (June 18) F. J. Otterway; K. V. Palmer; (June 22) P. A. Worrall; (June 29) R. T. R. Cowper; A. S. Boak.

Air Commodore Ronald Graham, D.S.O., D.S.C., D.F.C., is granted the acting rank of Air Vice-Marshal. (May 27).

The undermentioned Flying Officers relinquish the acting rank of Flight Lieutenant: (March 11) C. L. F. Colmore; (April 1) J. R. S. Romanes

F/O. R. D. Hesketh resigns his commission. (May 28.)

The undermentioned Pilot Officers relinquish their temporary commissions on return to Army duty: (June 14) A. P. C. McCulloch (2nd Lt., K.O.S.B.); (June 20) J. Smart (Lt., R.A.); (June 24) R. P. Thorman (2nd Lt., Lincoln R.); (June 26) P. T. Bush (Lt., R.A.S.C.).

The short service commissions of the undermentioned are terminated on cessation of duty: Pilot Officers on probation: (July 1) C. B. Elsdon; (July 17) C. Orme. Acting Pilot Officer on probation: (July 1) J. Hemingway.

Erratum.

In the *Gazette* of May 21. Notification concerning P/O. A. H. Humphrey *for* April 30 *read* May 1.

Technical Branch.

The undermentioned are granted commissions for the duration of hostilities as Flying Officers on probation: W.O.: (June 27, Seniority May 9) A. T. Martin; (June 28, Seniority March 14) S. G. Bowles; (June 30, Seniority May 9) A. E. G. Cole; (July 1, Seniority May 9) R. H. Gommo; (July 2, Seniority May 9) M. C. F. Witty. Temp. W.O.: (May 12, Seniority March 14) C. Howells; (June 14, Seniority May 9) G. Adams; July 1, Seniority May 9) A. E. Cock; J. E. Segrove.

The undermentioned are granted commissions for the duration of hostilities as Pilot Officers on probation. (Seniority May 16): Flt. Sgts.: (June 21) W. Kerswell; (June 22) W. D. Browne; (June 28) S. F. Mitchell; G. L. O'Hanlon; (June 29) J. R. C. Lane; (July 1) A. W. Caswell; (July 2) S. J. Meagor; (July 3) D. H. Grundy; (July 9) W. A. Harrison. Temp. Flt. Sgts.: (July 4) D. A. Harrison. Sgts.: (July 2) H. Robinson; (July 5) E. Hearl. Temp. Sgts.: (June 26) N. D. Humphreys; (July 8) F. C. Woolley.

The undermentioned are granted commissions for the duration of hostilities as Pilot Officers on probation. (Seniority May 30): Flt. Sgts.: (June 28) L. A. Huxford; (July 2) F. T. Chiverton. Temp. Flt. Sgts.: (June 24) M. F. W. Clyne; (July 1) R. C. Parry; (July 3) P. Feighan.

The undermentioned Flying Officers on probation are confirmed in their appointments: (June 12) W. B. Lang; R. J. Chedd; A. B. Collins; P. W. J. Dawes; F. G. Hammond, A.F.M.; J. E. Horton; (June 19) E. R. J. Taylor; W. Steele; W. H. Geddes; J. Thom; (June 23) H. Cadman; T. E. Leicester; K. Roberts; W. G. Lawrance; A. R. Pearce; H. Lyons; (June 28) A. S. C. Jukes; (July 3) A. S. Kerr; (July 12) J. Goude.

The undermentioned Flying Officers are promoted to the rank of Flight Lieutenant. (Seniority May 18): (June 17) F. Stevens; (July 1) E. D. Jackson; (July 15) A. J. V. Parish; N. L. Claxton; (July 16) A. B. Kendall; (July 19) W. E. Wendon.

Administrative and Special Duties Branch.

The undermentioned are granted commissions for the duration of hostilities as Flying Officers on probation: (July 9, Seniority June 20) W/O. B. A. Wearing; (July 3, Seniority June 20) Temp. W/O. W. F. Austin.

The undermentioned are granted commissions for the duration of hostilities as Pilot Officers on probation: Temp. W/O.: (June 28, Seniority April 25) A. E. Robinson. Flt Sgt.: (July 2, Seniority June 20) H. W. M. Stott. Temp. Flt. Sgt.: (July 1, Seniority June 20) H. J. K. Snowdon. Sgt.: (July 2, Seniority June 20) D. L. Williams.

Cpl. F. N. Morris is granted a commission for the duration of hostilities as Acting Pilot Officer on probation. (July 1, Seniority June 17.)

Erratum.

In the *Gazette* of June 25 notification concerning 331530 W/O W. C. Cox (43738) *for* June 6, 1940, *read* June 8, 1940.

Equipment Branch.

The undermentioned Pilot Officers on probation are confirmed in their appointments: (April 3) H. G. L. A. Brooking; (May 1) N. J. Fagan; C. S. Campbell.

The undermentioned Pilot Officers on probation are confirmed in their appointments with effect from April 3 and promoted to the rank of Flying Officer: (June 5), J. A. Burns; (July 3) H. J. L. H. Haig.

The undermentioned Pilot Officers on probation are confirmed in their appointments with effect from the dates stated and promoted to the rank of Flying Officer. July 17:—(April 17) W. Kelly, W. S. Roe; (May 1) G. W. Henderson.

The undermentioned Pilot Officers are promoted to the rank of Flying Officer:—(May 1) J. P. W. Purves, E. M. Sopwith; (May 20) E. V. Davies, H. R. K. Wells; (July 3) A. Mills, A. G. Parry-Jones, V. E. Robinson, R. A. Salter, M. R. Frazer, D. J. Marler, C. E. M. Hansel, L. J. M. Wescott; (July 17) M. L. Copeland, J. Hughes, P. G. M. Ridsdale, L. W. Wynn.

Accountant Branch.

Temp. W/O. S. S. Caris is granted a commission for the duration of hostilities as Flying Officer on probation (July 2, Seniority June 6).

The undermentioned are granted commissions for the duration of hostilities as Pilot Officers on probation. (Seniority June 6):—Flt. Sgt.: (July 3) R. A. Weston. Sgts.: (June 14) A. Powell; (June 18) E. J. Watson.

The undermentioned are granted commissions for the duration of hostilities as Acting Pilot Officers on probation. (Seniority June 6):—Sgts.: (June 29) C. W. Corless, J. B. Harrison. Cpl.: (June 30) W. L. Collis.

The undermentioned Pilot Officers on probation are confirmed in their appointments with effect from April 17 and promoted to the rank of Flying Officer with effect June 1:—J. B. Bennett, W. A. Covill.

The undermentioned Pilot Officers on probation are confirmed in their appointments and promoted to the rank of Flying Officer:—(June 10) A. M. Fletcher, A. J. Smith, O. Gradon.

The undermentioned Flying Officers are promoted to the rank of Flight Lieutenant:—(June 14) W. H. M. Kimpton, A. F. Hall, J. A. Wallis.

Erratum.

In the Gazette of July 9. *For* 348414 Flt. Sgt. J. R. Copstake (43919) *read* 348414 Flt. Sgt. J. R. Copestake (43919).

Medical Branch.

Temp. W/O. L. G. Moy is granted a commission for the duration of hostilities as Quartermaster and Flying Officer on probation. (July 5, Seniority June 20.) F/O. J. Crawford, M.B., Ch.B., is promoted to the rank of Flight Lieutenant. (June 5, Seniority June 5, 1939.)

Royal Air Force Reserve

RESERVE OF AIR FORCE OFFICERS.

General Duties Branch.

The undermentioned are granted commissions in class CC in the ranks stated. June 1:—Wing Commander: H. Hemming, A.F.C. Flight Lieutenants: G. Adams, M. Spender.

The undermentioned Flying Officers are promoted to the rank of Flight Lieutenant:—(Sept. 3, 1939) C. G. H. E. Lumsden; (June 22) T. W. Ashton, T. L. I. Bell; (June 28) D. R. C. Barrois de Sarigny, J. A. Tinne. P/O. S. C. Rochford is promoted to the rank of Flying Officer (March 23). Sgn. Ldr. J. G. Murray is granted the rank of Wing Commander (June 23).

The undermentioned are transferred to the Administrative and Special Duties Branch:—(June 26) F/O. A. J. S. Negus; (July 6) F/O. J. C. Tichurst; (July 16) F/O. H. J. Raymond.

Sqn. Ldr. A. R. Hughes, M.B.E., relinquishes his commission in class CC on appointment to a commission in the Royal Air Force Volunteer Reserve (February 15). (Substituted for notification in Gazette of June 4.)

The notification in Gazette of July 9 concerning Flt. Lt. Thomas Herbert Wilson is cancelled.

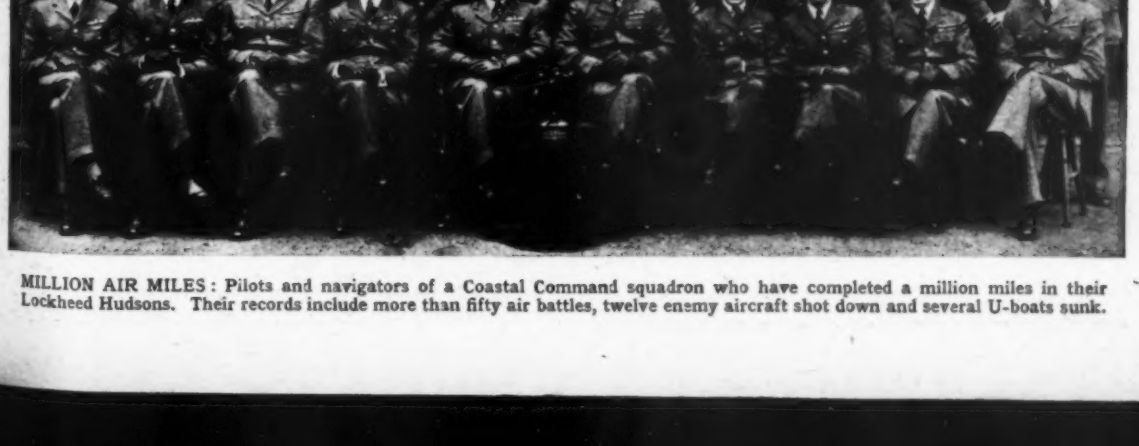
Dental Branch.

Flt. Lt. E. Sharp, L.D.S., relinquishes his commission on account of ill-health (July 12).

Royal Air Force Volunteer Reserve

General Duties Branch.

The undermentioned are granted commissions for the duration of hostilities as Pilot Officers:—(May 24) H. H. Crawford, J. T. Davison, W. J. Finlayson, A. D. Greer, H. M. Hoadley, D. M. Poynter, J. S. Priestley, W. G. Raphael, G. D. Sise, A. S. Anderson, H. R. Hall, E. W. G. McKenzie, J. McKenzie, W. D. Brown.



MILLION AIR MILES: Pilots and navigators of a Coastal Command squadron who have completed a million miles in their Lockheed Hudsons. Their records include more than fifty air battles, twelve enemy aircraft shot down and several U-boats sunk.

SERVICE AVIATION (CONTINUED)

The undermentioned Sergeants are granted commissions for the duration of hostilities as Pilot Officers on probation:—(April 1) J. Flinders, P. E. Bedell, G. W. Haigh; (June 8) D. J. Neill, V. D. Emms, P. A. G. Wickman; (June 9) D. R. Tuppen, E. N. Ward; (June 18, Seniority May 2) A. W. Bevan, D. N. McCarthy; (June 18) P. J. T. Stephenson, J. E. Sulman; (June 20, Seniority May 9) L. D. Wilson; (June 22) J. Sinclair; (June 26, Seniority April 25) M. A. Brundall; (May 26) R. S. Don; (June 27, Seniority April 25) R. J. Miller; (June 29) J. M. Birkin, J. S. Kennedy, J. A. S. Russell, W. E. Nixon, E. E. Hives, J. A. Ingham, W. E. King; (June 30) O. V. Hanbury, D. E. Kennedy, J. L. Montague, R. E. Pope, C. H. T. Short; (July 6) R. L. Jones, C. C. Lee, R. K. Potter, J. G. Benson, G. H. Corbett, K. H. Cox, E. F. Edsall, G. M. Forrester, C. K. Gray, K. C. Gundry, H. A. Kidd-May, E. B. Rogers, E. J. Watson, R. E. N. E. Wynn. Leading Aircraftmen: (June 30) R. C. Blockey, J. H. M. Davies, W. A. Tetley.

The undermentioned are grantel commissions for the duration of hostilities as Pilot Officers on probation:—(April 29) J. H. Tanner; (May 25) C. S. Davis; (June 25) M. A. Lacayo.

The undermentioned are granted commissions for the duration of hostilities as Acting Pilot Officers on probation:—(May 18) J. H. De V. Stuart; (June 28) A. W. Barnes, J. H. S. Bebington, J. W. Bishop, E. W. Blackwell, E. Burdon, R. L. Colvin, F. G. H. Chalk, F. Combie, R. Coryat, D. Cowburn, J. S. Davidson, G. E. Davies, F. M. Davis, M. C. B. de Sarigny, E. G. Fowler, G. M. Frame, A. Franks, D. Goodman, C. A. Harris, E. S. Harries, J. E. W. J. Henry, F. Ivins, D. A. Jackson, A. L. Jukes, E. G. S. Lister, I. Maitland, J. Marsden, F. McHardy, T. F. W. Nixon, F. H. Pole, W. C. Rasbary, J. N. Roach, W. J. Robertson, G. H. Seeley, A. E. Sinclair, W. L. Theys, N. Thom, D. Tingay, A. K. Watson, P. A. S. Woodwark; (July 2) R. J. Burleigh.

The undermentioned Pilot Officers on probation are confirmed in their appointments:—(March 29) H. L. N. Davis, S. P. Russell, A. E. Hill, M. E. Burnham.

The undermentioned Acting Pilot Officers on probation are graded as Pilot Officers on probation:—(May 13) J. G. Warry; (May 29) H. Jacobs. (Substituted for notifications in the Gazette of June 25.)

The undermentioned Acting Pilot Officers on probation are graded as Pilot Officers on probation:—(March 16) E. S. Judd; (June 1) E. G. Curtice, E. L. B. Kent, F. W. Seed, D.F.C.; (June 22) A. M. W. Scott; (June 29) R. M. Broadhead.

The undermentioned Pilot Officers are promoted to the rank of Flying Officer:—(May 9) H. A. Skeats; (April 18) C. A. Wood; (June 20) R. H. Masters. Acting Pilot Officer on probation F. K. Pease is transferred to the Balloon Branch and graded as Pilot Officer on probation (July 15).

The undermentioned Acting Pilot Officers on probation are transferred to the Administrative and Special Duties Branch and graded as Pilot Officers on probation:—(June 16) N. A. J. Spencer; (July 1) F. S. Halls.

The undermentioned Pilot Officers on probation are transferred to the Administrative and Special Duties Branch:—(July 6) D. P. Jones, A. W. Wood.

The commissions of the undermentioned are terminated on cessation of duty:—Pilot Officers on probation: (July 13) M. H. Ross; (July 16) E. H. Garland. Acting Pilot Officer on probation: (June 4) J. H. De V. Stuart.

Errata.

In the Gazette of May 14. Notifications concerning the undermentioned should have appeared under the heading "Royal Air Force Volunteer Reserve" instead of "Royal Air Force":—V. E. Arnold, J. B. Harris.

In the Gazette of July 16. Notification concerning the undermentioned. *For* Acting Pilot Officers on probation *read* Pilot Officers on probation:—J. O. Hedley, R. W. J. Hooper.

In the Gazette of June 18. *For* 774004 L.A/C. Michael Keeble-White *read* 774C04 L.A/C. Michael Keble-White.

Technical Branch.

The undermentioned are granted commissions for the duration of hostilities as Acting Pilot Officers on probation:—Sgt.: (July 5, Seniority May 30) F. Inchley. L.A/C.: (July 1, Seniority May 16) F. G. Runge. A/C.2: (June 27, Seniority May 16) R. O. Gordon.

Balloon Branch.

The undermentioned are granted commissions for the duration of hostilities as Pilot Officers on probation. (Seniority June 24):—Act. Flt. Sgt.: (July 1) A. L. Saver. Temp. Cpls.: (June 30) H. I. Hadley; (July 3) H. S. Mander; (July 8) J. R. Broad. Act. Cpl.: (July 2) A. Kenworthy. L.A/C.: (July 4) R. P. Moulsdale. A/C.1: (June 29) J. J. Loughan; (July 3) J. E. Allen-Jones; (July 4) E. H. B. Norton.

The undermentioned Corporals are granted commissions for the duration of hostilities as Pilot Officers on probation. (Seniority April 25):—(June 5) H. T. Murly-Gotto; (June 7) H. M. A. Cocks.

Administrative and Special Duties Branch.

The undermentioned are granted commissions for the duration of hostilities as Pilot Officers on probation:—Cpls.: (June 25, Seniority April 25) J. C. Walker; (June 28, Seniority April 25) E. J. Brice. Temp. Cpl.: (June 15, Seniority April 25) W. Taylor. L/A.: (June 5, Seniority April 25) R. C. Blow; (July 2, Seniority May 30) G. A. Clotud. A/C.1: (July 7, Seniority June 24) F. R. Dixon. A/C.2: (July 3, Seniority May 30) A. Pearlman; A. Smith.

The undermentioned are granted commissions for the duration of hostilities as Pilot Officers on probation:—(January 23) D. B. Fry; (May 30) The Hon. G. R. Bellew, M.V.O.; (June 12) K. J. Cadwallader; (June 20) J. H. Emmerson; (June 21) R. A. A. Cobb; W. B. H. Eaton; E. G. Sullivan; (June 22) A. J. Barraclough; S. A. Bishop; R. Williams; (June 24) J. W. Gardner; C. A. McConchie; T. V. Preedy; P. B. Showan; (June 25) T. G. F. Paget; C. C. O. Stuckey; (June 28) J. C. Cotton; R. E. Hume-Williams; A. Jackson; J. H. Jennings, A.F.C.; K. A. H. Paterson; R. B. Whittingham; (June 29) I. S. Morgan; L. H. Spencer; E. L. Turner; (June 30) R. S. Heape; S. H. J. Joel; G. W. Lightfoot; (July 1) F. E. C. Cox; J. S. Wreford; (July 2) L. C. E. Howse; G. F. W. C. Hughes-Chamberlain; H. G. H. Lowe; B. C. Murton-Neale; E. A. Nodin; B. C. W. Stanley; H. N. Walduck; (July 3) P. J. W. Cayley; A. V. Darlington; F. C. Lander, A.F.C.; F. F. McKenna; B. J. McVicar; C. J. Metcalfe; J. K. Milne; V. C. Morris; E. V. Pemberton; D. Reekie; (July 4) J. P. Burnet; G. W. Collyer; W. M. Elverston-Trickett; R. H. Hume; A. S. Kelsey; C. B. H. Lefroy; H. Middleton; H. L. Reed; J. E. Taylor; P. F. Trotter; C. H. Watson; (July 5) A. E. Allan-Taylor; J. A. B. Ball; C. H. S. Blatch; B. J. Bratby; R. Carnie; H. S. Chalk; R. J. K. Chattey; W. P. Cruickshank; J. A. Davison; T. I. S. Eeley; W. B. Enever; O. A. Guggenheim; E. T. King; G. C. Lees; S. C. Mimmack; R. C. K. Smith; D. J. W. T. Wallace; G. St. P. Wells; R. H. F. Whiteside; (July 6) A. R. Hewitt; K. C. J. C. McLaglen; H. S. Ruttle; D. W. Trotter; E. P. Ward; C. H. Ward-Jackson; J. H. Wilson, M.C.; P. M. Wright; (July 7) W. T. Duffey; G. J. W. F. Lock; C. J. Smith; (July 8) H. V. Cox; M. R. Everard; A. G. Hardwick; S. A. B. Harries; (July 9) L. C. Baker; P. B. L. Coghlan; F. J. Davies, D.F.C.; G. M. Phillips; (July 10) B. C. Harrison.

The undermentioned are granted commissions for the duration of hostilities as Acting Pilot Officers on probation:—L/A. (July 1, Seniority June 17) W. A. O'M. S. Brayton; A.C.2 (July 1, Seniority June 17) R. N. Walford.

The undermentioned are granted honorary commissions in the ranks stated (July 5):—Group Capt. C. W. Evans; Wing Cdr. E. E. Crouch; Sqn. Ldrs.: R. F. Havell; F. J. Howarth; H. A. Cooke; F/Os.: T. F. J. Connor; J. J. Watson; P/Os.: T. W. Lidstone; W. T. Norman; P. Roberts.

M. F. Cooper is granted a commission for the duration of hostilities as Pilot Officer on probation, December 10, 1939. (Substituted for notification in Gazette of January 16.)

A. R. Enshaw is granted a commission for the duration of hostilities as Pilot Officer on probation, February 28. (Substituted for notification in Gazette of March 26.)

A.P/O. on probation R. D. Barlas is graded as Pilot Officer on probation with effect from December 28, 1939, and confirmed in his appointment July 18.

Lt.-at-Arms A. R. Hughes, M.B.E. (R.N. Ret.) is granted a commission as Flight Lieutenant (February 15, Seniority December 18, 1939). (Substituted for notification in Gazette of June 4.)

Flt. Lt. J. S. Wilson relinquishes his commission on cessation of duty (July 21).

Notification in the Gazette of May 14 concerning J. H. Tanner is cancelled.

Erratum.

In the Gazette of July 16, *for* G. T. Cain *read* G. Turner Cain.

Equipment Branch.

E. D. Kearns is granted a commission for the duration of hostilities as Pilot Officer on probation (June 20).

Accountant Branch.

The undermentioned are granted commissions for the duration of hostilities as Acting Pilot Officers on probation (June 29, Seniority June 6):—Sergt. P. Beynon. Cpl. J. Eames. Temp. Cpl. E. Cantrell L.A/C.: C. H. Adams, E. B. Beck, J. E. Bilton, G. M. D. Drummond, J. H. Henderson, E. A. James, K. V. Moss, G. Ruthven, A. L. Wooldridge. A/C.1: J. B. Sidford, A. E. Brown, C. H. Nicholson. A/C.2 G. A. Gilbert.

A/C.1 P. Green is granted a commission for the duration of hostilities as Acting Pilot Officer on probation (June 29, Seniority June 24).

The undermentioned are granted commissions for the duration of hostilities as Acting Pilot Officers on probation:—(June 29) A. W. Bennell; R. Boughey; G. T. Bradshaw; L. G. Crosby; M. S. Dennis; H. R. Hunt; R. Innell; G. T. Jones; A. W. H. Lenton; D. P. Lund; W. H. Martin; E. H. Page; H. B. Ravilious; R. J. Ruscoe; A. L. Thompson; W. H. Wilks; S. N. Worthington; G. Wright-Anderson; (July 1) G. C. Millichamp; B. E. Nichols; E. Page; (July 2) A. Blain.

Medical Branch.

The undermentioned are granted commissions for the duration of hostilities in the ranks stated:—Squadron Leader: (July 5) J. G. Milner, M.B., B.Ch., F.R.C.S. Flight Lieutenants: (July 2) A. D. D. Broughton, M.B., B.Chir., M.R.C.S., L.R.C.P., D.P.H., D.P.M.; A. G. Moore, M.B., B.S., M.R.C.S., L.R.C.P., D.P.M.; R. J. O'Connor, M.D., B.S., D.T.M. Flying Officers: (July 2) H. F. S. Beadles, M.R.C.S., L.R.C.P.; P. J. Blaxland, M.R.C.S., L.R.C.P.; C. M. Fenn, M.B., Ch.B.; S. J. Hadfield, M.B., B.Chir., M.R.C.S., L.R.C.P.; H. Halson, M.B., B.S.; E. H. Jones, M.R.C.S., L.R.C.P.; B. S. Kent, M.B., B.S., M.R.C.S., L.R.C.P.; R. R. Klein, M.B., B.S., M.R.C.S., L.R.C.P.; W. J. Lawrence, M.B., Ch.B.; J. H. McIlrath, M.B., Ch.B.; W. J. O. Page, M.R.C.S., L.R.C.P.; J. G. Paton, M.B., B.Ch., L.M.; R. W. K. Purser, M.R.C.S., L.R.C.P.; C. R. Savage, M.B., B.S., M.R.C.S., L.R.C.P.; W. F. Tierney, M.B., B.Ch.

Erratum.

In the Gazette of July 2. *For* Philip Ramier Beaufort Grimaldi, M.R.C.S., L.R.C.P., *read* Philip Rainier Beaufort Grimaldi, M.R.C.S., L.R.C.P.

Dental Branch.

The undermentioned are granted commissions for the duration of hostilities as Flying Officers (July 2):—E. H. Fletcher, L.D.S.; B. R. Hough, L.D.S.; D. E. J. Macfarlane, L.D.S.; M. C. Whiting, L.D.S.

Chaplains' Branch.

The undermentioned are granted commissions for the duration of hostilities with the relative rank of Squadron Leader:—(July 1) The Rev. R. J. Hodgins; (July 2) The Rev. W. B. C. Buchanan, M.A.; (July 9) The Rev. E. F. Donne.

Erratum.

In the Gazette of July 2. *For* the Rev. Harold Gordon Sellers *read* the Rev. Harold Gordon Sellers, O.B.E.

Auxiliary Air Force

General Duties Branch.

The undermentioned Acting Pilot Officers on probation are confirmed in their appointments and graded as Pilot Officers:—(May 4) A. C. Maclaren; S. F. F. Johnson; (May 18) C. D. Pain; (June 1) G. H. E. Welford.

Balloon Branch.

P/O. J. E. Lloyd is transferred to the Administrative and Special Duties Branch (July 12).

Women's Auxiliary Air Force

The undermentioned are appointed Assistant Section Officers on the dates stated:—(July 13) Cpl. Miss J. P. Backhouse; Cpl. Miss W. G. Baker; A/CW.1 Mrs. J. Barnes; A/CW.1 Miss K. E. Barrett; Sen. Sgt. Miss J. M. Boole; Cpl. Miss E. P. Campani; A/CW.2 Miss P. H. Charles; Sgt. Miss J. Dickens; A/CW.1 Miss P. S. Donisthorpe; A/CW.1 Miss M. McT. Duncan; A/CW.1 Mrs. M. Gemmell; Cpl. Miss Y. H. B. Hartford; A/CW.2 Mrs. T. A. M. Hipkins; Cpl. Miss R. M. Lambert; Cpl. Miss M. S. McKeachie; Sgt. Miss M. D. Marshall; A/CW.2 Miss J. A. Munn; Sgt. Miss N. S. Rich; A/CW.1 Mrs. D. J. Roberton; Cpl. Miss F. M. Slessor; A/CW.2 Miss A. A. Stevenson; Cpl. Miss H. M. Turnbull; (July 15) Sgt. Mrs. K. E. Utterson.

Assistant S/O. Mrs. K. M. M. Holmes relinquishes her appointment (June 23).

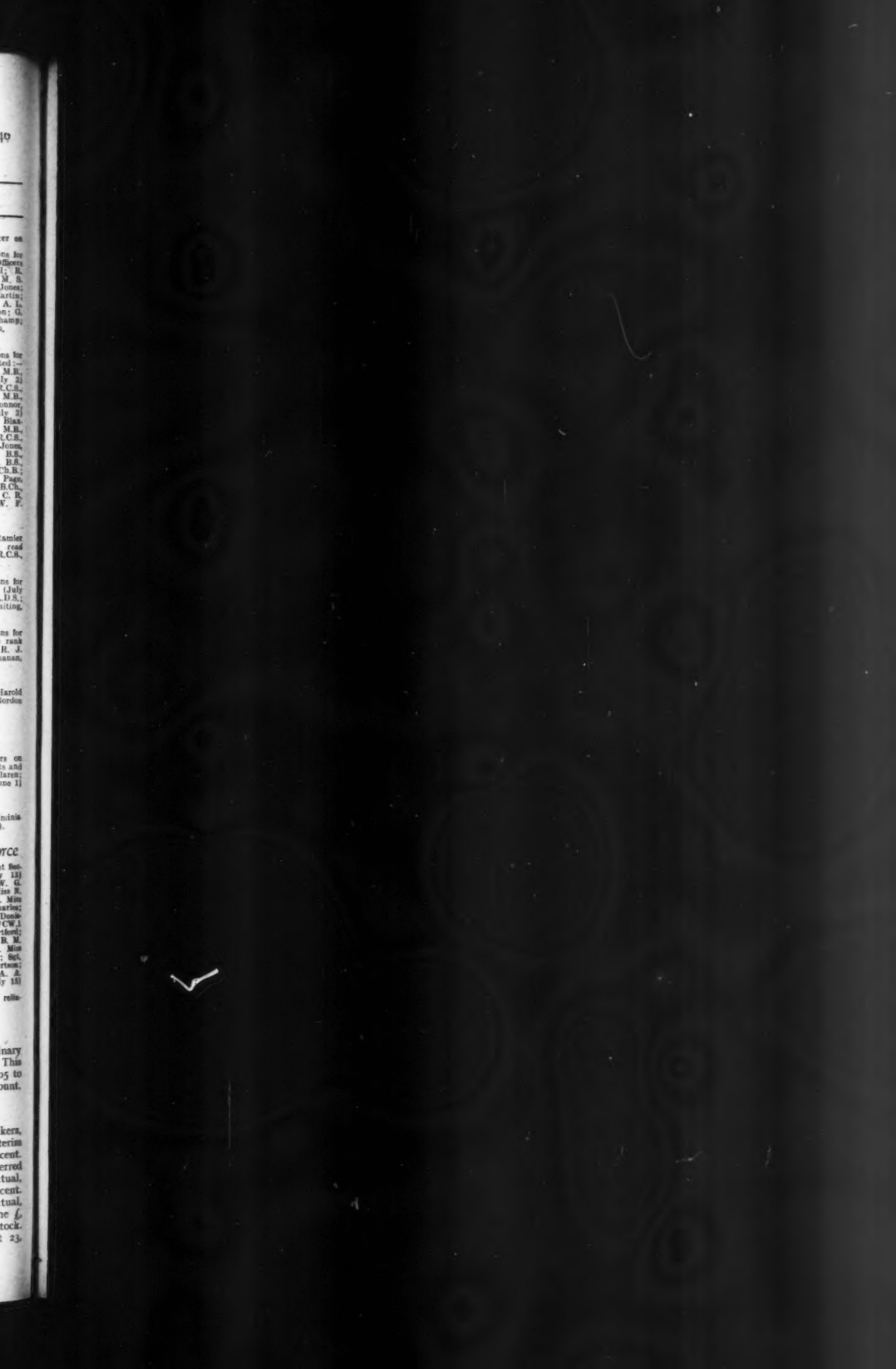
Airscrew Company Balance Sheet

THE balance sheet of the Airscrew Company, Ltd., for the year ended March 31, 1940, shows an extremely strong position.

Profit for the year, before providing for taxation, amounts to £86,341, and the balance brought in from the previous account is £19,769.

£64,000 goes to taxation, £5,000 to general reserve, and £3,900 to provide 6 per cent. dividend on the cumulative preference shares, and a further £4,875 was utilised for the interim dividend of 10 per cent. paid on November 20 last.

A balance of £28,336 remains, out of which the directors recommended payment of a final dividend on the ordinary shares of 15 per cent., less tax. This will absorb £7,031, and leave £21,305 to be carried forward to the next account.

Vickers Interims

AT a meeting of the Board of Vickers, Ltd., the undermentioned interim dividends were declared: 2½ per cent. actual, less income tax, on the preferred 5 per cent. stock; 2½ per cent. actual, less income tax, on the 5 per cent. preference stock; 2½ per cent. actual, free of income tax up to 6s. in the £ on the cumulative preference stock. Payment will be made on August 23, 1940.